August 1976

Smithsonian

A Morgan foal from the old
American all-purpose breed (p. 44)

Scratch overnight travel expenses for six.

Beechcraft Baron 58

This Beechcraft Baron 58, is back home again after an 800-mile, round-trip mission. It took off from here this morning, carrying a management team of six to inspect a new plant.

Today it has saved its company $200 or more in hotel, meal and incidental travel expenses. Simply because it cut in half a normal two-day trip by company car or airline and rent-a-car.

Economies like this are typical for the company that utilizes a Baron. But they're only part of the story.

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More convenient than an airline.

America's airlines do an important job, moving millions between about 500 major airports. The Baron can use these same destinations, plus over 11,000 more the airlines don't serve.

Often, an aircraft like the Baron is a company's only air link with its business destinations. What's more, that company can make these trips on its own schedules.

The 58 is one of four Barons that Beech offers to the business community. The net capital cost, for most corporations, is about $485 per month.

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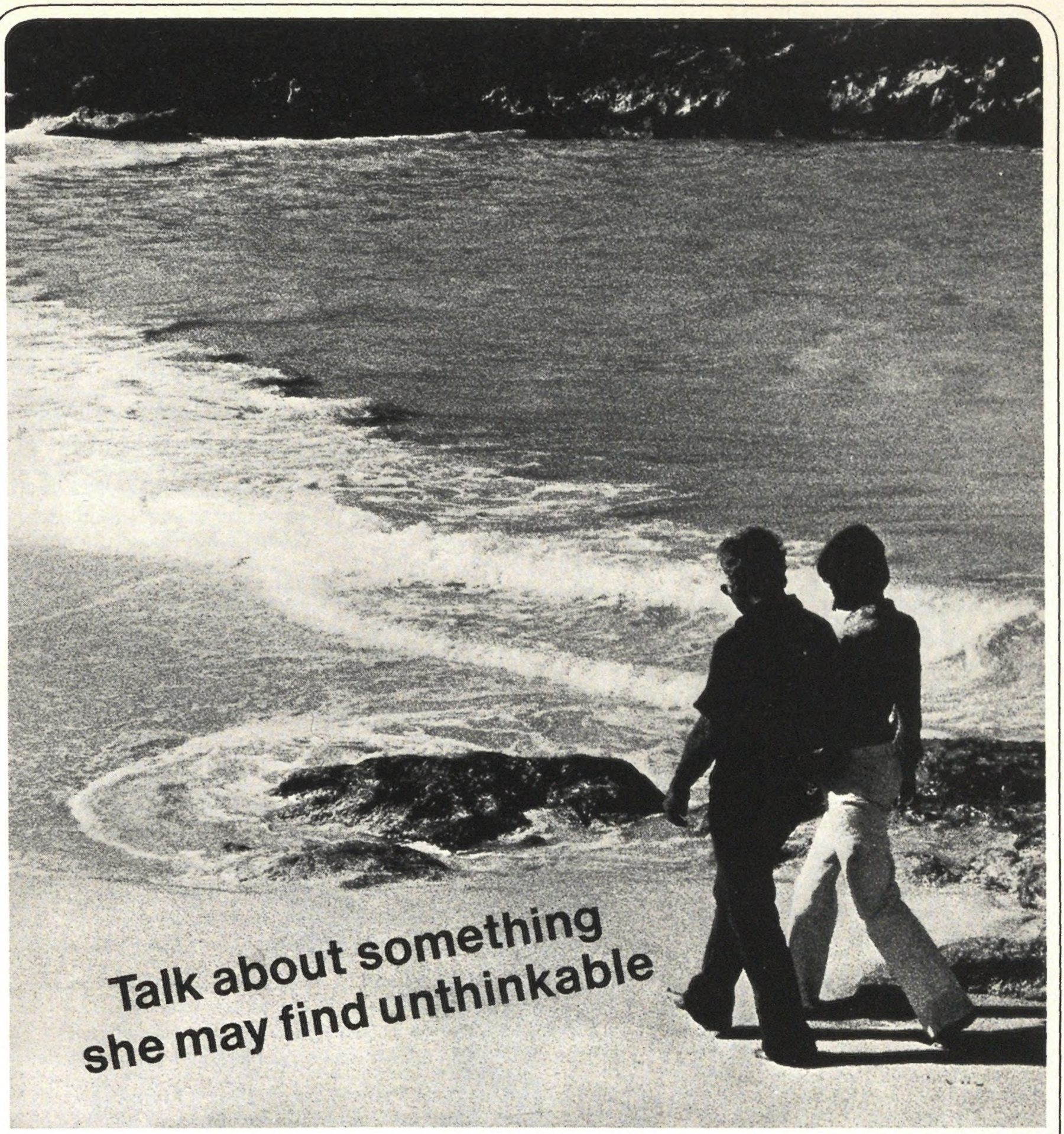

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American industry can't work magic.

It can create new jobs only when it expands.

At least 1½ million new jobs must be created every year from now through 1980—just to provide employment for young people reaching working age, and others entering the job market.

What will it take to create jobs for *them?* And to maintain existing jobs? *Industrial expansion.* New and expanded facilities that, when business picks up, would mean more jobs, larger payrolls, and greater earnings—all of which would help produce bigger government revenues.

The steel industry's a good example. We foresee a demand, by 1983, that calls for something like 30 million net tons of *added* raw steel-making capacity. That's a lot of steel. And gearing up to produce that added tonnage would provide work for a lot of people.

But getting there means the steel industry must spend $5 billion a year at least through 1983—for modernization, for compulsory environmental equipment, and for growth.

What's the key to getting the money we need for expansion and improvement of our plants? Better earnings* —earnings that can be invested in our operations and that will encourage investors to provide us additional money.

But this alone is not enough because under present Federal tax laws the government would take too much of any additional dollars we can earn. What we need now is Federal tax reform to help lower barriers to capital formation.

*In 1975, Bethlehem's earnings after taxes were only 4.8% of revenues.

Bethlehem

How you can help gear up the American economy

The tax-writing committees of the U.S. Congress are studying the subject of "Capital Formation."

Here are four tax measures which we believe the Congress should enact to encourage industrial expansion and to create jobs: (1) five-year capital recovery system, (2) 12% permanent investment tax credit, (3) write-off of the costs of pollution control facilities in the year they are incurred, (4) eliminate the double taxation of corporate profits paid out as dividends.

If you agree that revisions in present Federal tax laws are needed to provide the additional capital for more and better jobs, we ask you to tell that to your Senators and Congressman.

For a free copy of the folder, *"Project Mainspring—with your help it can wind up the American economy again,"* write: Public Affairs Dept., Room 476-S, Bethlehem Steel Corp., Bethlehem, PA 18016.

Secretary Ripley's comments

The view from the castle

At a signal from a spacecraft above Mars
the new Air and Space Museum opens,
celebrating the upward strivings of Man

At approximately 11:25 A.M. on July 1, 1976, a signal from the Viking spacecraft approaching Mars reached a duplicate of the Viking's clawlike digging tool set up on Washington's Mall. The red light stopped blinking, a loop of wire on the mechanical arm heated up with the energy released from the pulsed signal, and the ribbon across the doorway charred and dropped away. Thus, with a flourish from space, the National Air and Space Museum was opened officially to the delight of President Ford, Chief Justice Warren E. Burger and a happy assemblage of dignitaries and plain citizens champing at the bit to get inside the latest creation of the Smithsonian.

There is little doubt that this Air and Space Museum is the finest in the world, containing more exhibits and more explanatory demonstrations on Man's dreams and achievements in flight than any other. There is little doubt that its perfections will make it the most popular. For myself and my colleagues this fantastic building represents the culmination of the Smithsonian's own dreams of more than 100 years. In a curious way this Institution's history has been intertwined with the history of flight, dating back to Civil War days when Joseph Henry, the Institution's first secretary, persuaded President Lincoln to authorize a ballooning corps for the observation of Confederate troop movements. In 1896, Secretary Langley flew an "aerodrome," so-called (a tandem-winged, unmanned aircraft powered by a steam engine), for more than a half-mile on the Potomac. In this century, Secretaries Walcott and Abbot supported Robert Goddard's experiments and urged the creation of the National Advisory Committee on Aeronautics, the forerunner of today's NASA.

The great instruments of flight are assembled here, from the Wright brothers' plane, through Lindbergh's, to the recent epoch-making space vehicles. There is even a piece of "moon rock" that every visitor can touch. As President Ford noted in his opening remarks, there is something peculiarly American in this museum, for it certainly celebrates this nation's unique technological contribution to the 20th century. It exemplifies the fact that "the American adventure is driven forward by challenge, competition and creativity. It demands of us sweat and sacrifice and gives us substance and satisfaction. Our country must never cease to be a place where men and women try the untried, test the impossible and take uncertain paths into the unknown."

These are stirring words for our Bicentennial year, and as we look at Lindbergh's *Spirit of St. Louis* and visualize his flight by dead reckoning across the Atlantic 49 years ago, or relive the tense moment of the astronauts taking *off* from the Moon, we are reminded that great accomplishments demand a price in creative vision, sacrifice, sweat and at least a modicum of tears. That holds true with this fascinating marble and glass building. Now that it is open, demonstrating the creativity of which we are capable, let us get on with the work of research and study in astronomy and astronautics so that we may understand, as the next century proceeds, who and where we are and where we are going.

S. Dillon Ripley

Six compelling reasons why you should enroll now in the Wedgwood Collectors Society:

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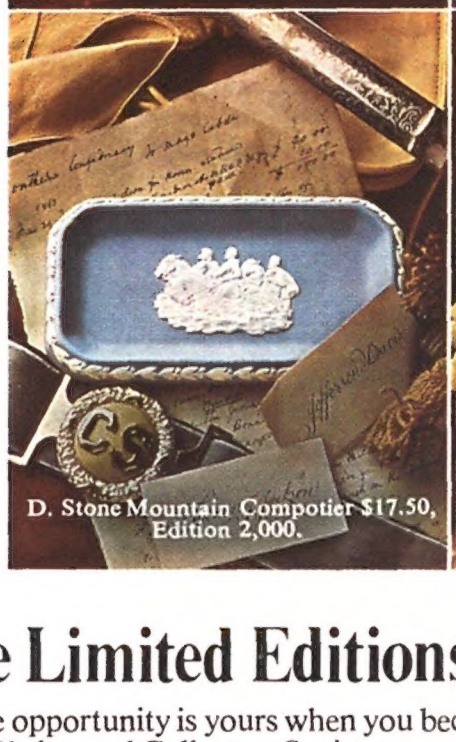

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Photographer Dick Swanson catches one of the National Zoo's white tigers splashing happily in moat at the William M. Mann Memorial Facility.

Around the Mall and beyond

Cats hate water. Everyone knows that. Cats feel about water the way humans feel about rush-hour traffic. Provide a cat with some water to get into, and he'll look at you with amazement tinged with sorrow and stalk off to lie on the window sill beside the geranium pot.

Tigers are cats, right? Then how about the photograph at the left of the new William M. Mann Memorial facility for lions and tigers at the Smithsonian's National Zoo?

Lion and tiger hill opened in April—a pleasant, terraced knoll upon which the great cats can sprawl either on warm grass or beneath trees or in the cool shade of caves. A broad moat filled with clear water surrounds the lowest terrace.

The lions have one section of the hill and they loll around on it the way lions are supposed to, in friendly little groups, not saying much to each other, flicking their tails at an occasional fly, content with silent companionship.

The tigers have the other section. These are white tigers (see SMITHSONIAN, April 1971), the zoo's own elite collection, and they do their lolling in elegant solitude the way tigers are supposed to. They also sometimes roll onto their backs and curl their paws in the air as though they wanted someone to scratch their bellies. I guess tigers are supposed to do that, too. And—they also leap into the moat and splash around in the water, playing with a floating beer keg.

At least that's what the photograph tells us. To check up on it, I went out to the zoo and had a look. There was the new lion-tiger hill. Beautiful. There were the lions lolling in groups. There were the tigers lolling in solitude. There was

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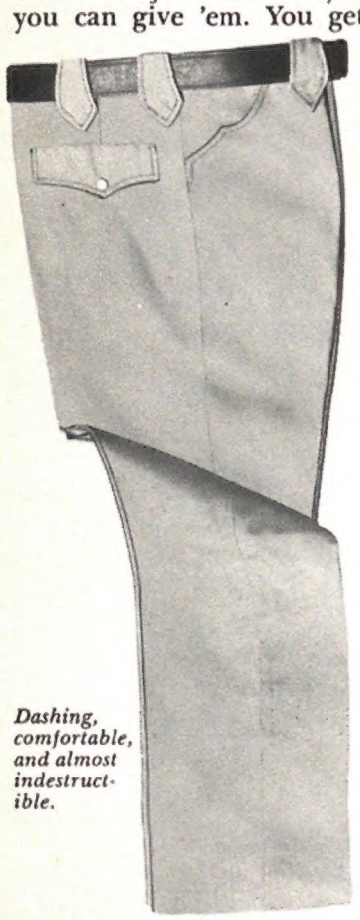

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one lolling on his back waiting, with his mouth awater, for someone to scratch his belly. There was the moat and there was the floating keg. Nothing else. I watched the tigers for a long while, and they just lolled. They didn't swim. I *still* say cats hate water.

While at the zoo, I dropped in at the splendid monkey house, the opening of which I had attended more than a year ago. At that ceremony I noted the woolly monkey (SMITHSONIAN, August 1975) who spent the entire time staring morosely at the bartender because he was not being served a gin and tonic along with everyone else. I found him still morose, still looking for that unfeeling barman. He is a dominant member of the woolly monkey collection and he carries his sense of injustice with him as he shoulders his way among his tribe. I could see small woolly monkeys being snatched out of his path and told to behave or he'd get them. He probably was perfectly friendly until the night the tapman refused him a double shot of Old Red-eye on the house. That sort of treatment can surely ruin a woolly monkey.

Being a woolly monkey lush is one thing, but perhaps even worse is being a gorilla TV freak. Nicky the Gorilla has, I'm sorry to report, become a confirmed tube boob. He demands—and, this being The Zoo That Cares, he gets—a set for his cage and is allowed to watch from 10:30 in the morning until 3:30 in the afternoon. He likes to lie on his side, head cradled on one palm, while he learns all about the game shows and follows the ordeals of Julie in "Days of Our Lives." He likes the commercials best.

Though the zoo is a little embarrassed about this, it appears that one time Nicky's set was left on by mistake. The next day, he was too tired to do anything but doze. Apparently he'd been right through the family shows, the cop shows, the 11 P.M. news and the late shows, and for once was up to here with TV.

When our colleagues at the National Geographic Society produced their film *Search for the Great Apes*, a copy was screened for the interested members of our zoo: the orangutans Jennie, Archie, Atjeh and Pensi, and the gorillas Nicky and Femelle. The first four responded to the parts of the film which dealt with their species. Femelle, who is not a TV addict, watched a bit of the gorilla section and then lumbered off. Nicky, of course, kept his eyes glued to the whole thing, was obviously bored with the orangutans, but became absorbed with the gorillas. When one of them, on the screen, beat his chest, Nicky, lying as usual on his side, raised a hairy arm and almost languidly followed suit, for all the world like the small boy watching a western, who when the lead flies in the shoot-out scene, half-consciously extends his index finger and makes that *"kuh, kuh"* sound that all small boys instinctively know how to make.

Mulling over these monkeyshines, I strolled past more of the renovations in the zoo, and suddenly, just on the hour, heard the happy tinkle of the new Pelzman Memorial Glockenspiel just inside the Connecticut Avenue entrance. This is a new donation—in fact the largest donation by an individual since the zoo was founded. It is charming, with its four animal figures that move as its bells chime their hourly tunes.

I was interested in what effect this sound has had on the neighboring animals and birds, and have learned the answer: none. The nearest neighbors are the dorcas gazelles, which are notoriously skittish. But when the chimes ring they just flick an ear and go on grazing.

After this sojourn at the National Zoo, I found myself back on the Mall at the Museum of Natural History—haunted by a niggling desire to find out if cats really *do* like water (they do, the photograph didn't lie) and there discovered that an insect zoo will open this month. That's right: live insects, or to be more precise, "bugs," since the creatures displayed will include millipedes, centipedes, crabs, spiders—much more than true insects. Here, among other things, will be a free flight cage, 60 feet long, with grass and other vegetation, a forest and a pond. Viewers (safely outside) will watch webs being spun, flies being caught, eggs being hatched, larvae becoming winged creatures—all the life of this small world.

Bees will have their own cage where you can see their life cycle. Leaf-cutter ants are expected to steal the show. These critters harvest leaves, chop them up in portable pieces, carry them home and then farm the fungus that grows on them.

The insect zoo celebrates arthropods, the world's most successful animals. They've lasted more than 400 million years and make up nearly 80 percent of

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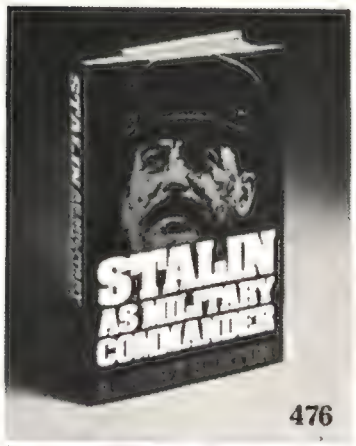

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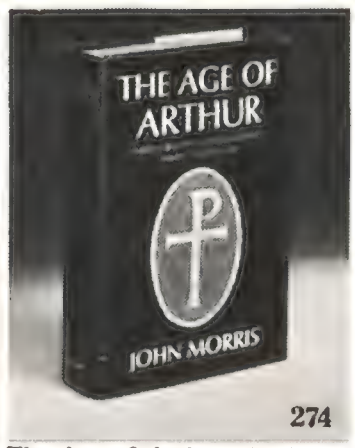

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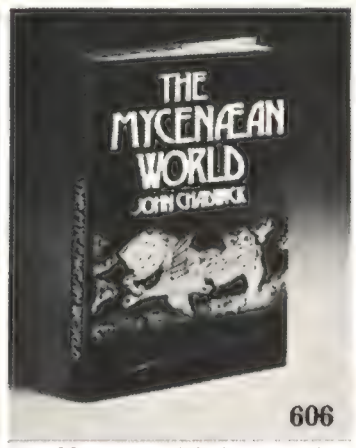

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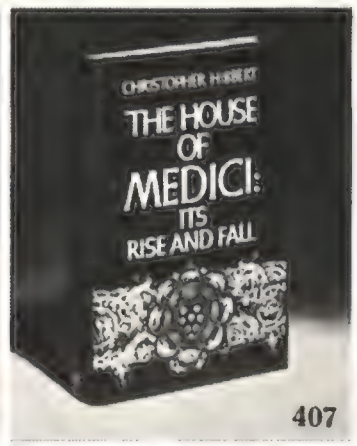

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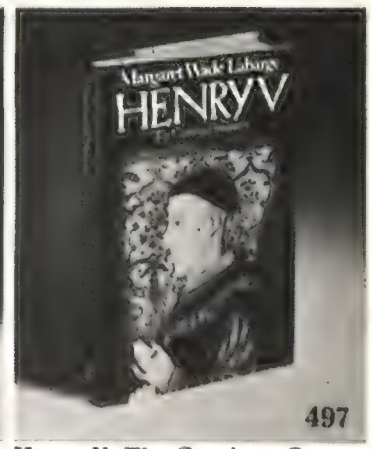

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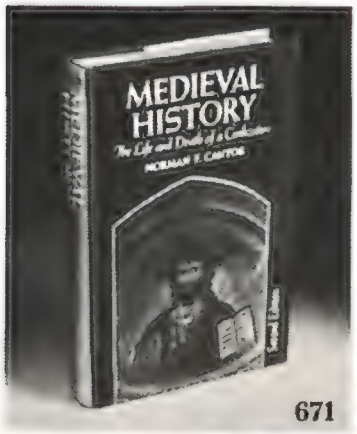

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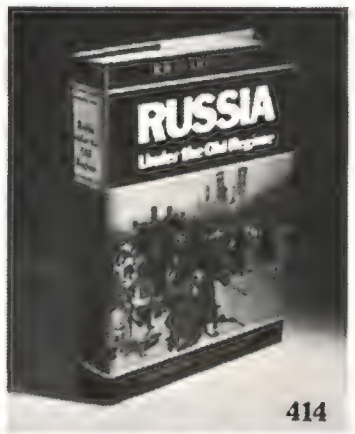

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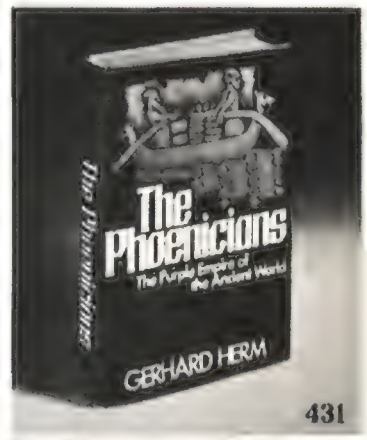

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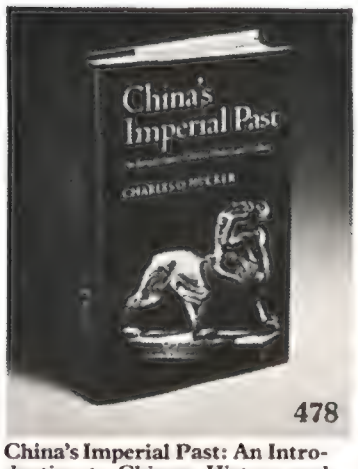

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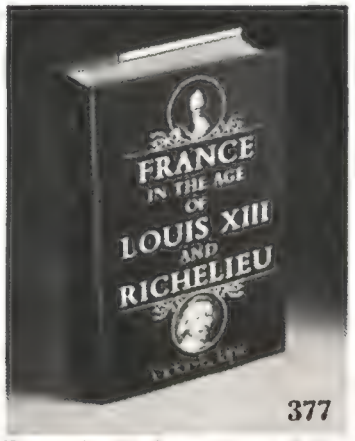

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all Earth's creatures. They make us look sick. Designer Beth Miles and curators Dr. Terry Erwin and Dr. Ginter Ekis have put together an exhibit that should make us feel . . . well, not sick, but aware of just where we stand in the scheme of things. You might call us Johnnies-come-lately-and-likely-to-leave-early.

Prior to the opening of the insect zoo on the 23rd of this month, the Smithsonian will play host at a reception for the XVth International Congress of Entomologists, the largest gathering of bug experts (some 2,000) ever to meet in Washington. They will visit not only the Smithsonian's Entomology Department, but also those of the Department of Agriculture, its Forest Service and other places. There are so many governmental and national entomology sections in Washington that it would be accurate to describe it as the bug capital of the world.

This Bicentennial convention is being sponsored by the National Academy of Sciences and the Entomological Society of America and is the first one held in the States since 1928. Certainly a high point for the delegates will be their preview visit to the insect zoo, where they will study the living habitat groups knowingly and nod approvingly at the reminder that is displayed above the exit:

i do not see why men
should be so proud
insects have the more
ancient lineage
according to the scientists
insects were insects
when man was only
a burbling whatisit

That profundity, of course, is archy's from *the lives and times of archy and mehitabel* by Don Marquis. Other lines, equally pithy though less well known, have been produced by a slight, dark-bearded young lepidopterist on the top floor of the same Natural History Museum: John M. Burns.

Here is a rarity: a man devoted to both science and literature. As an undergraduate, he almost majored in English. As a faculty member at Harvard he developed the knack of introducing speakers at a natural history seminar with bits of doggerel. They brought down the house. He sent ten to the editor of the group's newsletter in response to the latter's request, and finally cajoled the editor into publishing them.

Much later, an honest-to-God New York publisher called and suggested a book of biological poetry. Seems the publisher was a natural history nut and had been getting that newsletter. After a couple of those New York-type martini lunches, Dr. Burns signed a contract with Quadrangle/The New York Times Book Co., and has now become a modest literary light, despite being a lepidopterist.

I idly glanced at the first poem in his book, *Bio Graffiti: A Natural Selection*. It is called "Conform":

I want to be scene,
Not herd, said a wayward
Young springbok, as it split.
Know your place, said
The leader, which is together,
And clubbed the errant back,
Giving it the Gesellschaft.

I decided, right there, to get the book. First I asked Dr. Burns how long it took him to knock off something like this.

"Sometimes two or three weeks," he told me, and revealed that even the shortest poem required a week to find the right title. This little beauty is called "To a Lonely Hermaphrodite":

Know
Thyself.

This poem is accompanied by a line drawing of, by gosh, a lonely hermaphrodite. All the poems are similarly illustrated with sketches gathered from existing sources, some going back a few centuries, selected by Burns' wife Sarah.

Bio Graffiti has sold 1,500 copies—no, 1,501 as of this moment. That's not bad for a book of poetry, but it won't make Dr. Burns a millionaire, and many of his colleagues think he's crazy to waste time this way. Burns believes it's a good idea to make science a sort of pleasure—an attitude wholly shared by the Institution where he now works. If his peers complain too much, he can always disappear for a while and come back with some pungent quatrains about *them*.

Warning: If the recipes for syllabub keep coming in (see May issue), your faithful correspondent is going to grow pudgier and dottier than ever. Naturally, I try them all—recipes from Charleston, from Britain, from Philadelphia, and stops between. The one I didn't try required a gill of sugar and a half a gill of wine to be placed in a pitcher, then "take it to the cow and milk it full."

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Phenomena, comment and notes

Early Man and woolly mammoths, a modest proposal for slugs, a Bristol connection, and new tropical foods

When the Spaniards arrived in the land of the Aztecs, they found the natives using some plants of the genus *Amaranthus* for food and as part of their religion. Since heathenism couldn't be tolerated, neither could the amaranths, and so these plants have remained inconspicuous ever since. But if the National Academy of Sciences has its way, you may before long be eating amaranth bread.

It turns out that amaranths grow fast and produce a grain rich in protein, especially in the essential amino acid, lysine, which is rare in significant amounts in most plants. In a report entitled *Underexploited Tropical Plants with Promising Economic Value*, the Academy urges study of the potential of amaranths and 35 other plants.

Another one, for example, is buffalo gourd, which grows wild on the arid deserts of the southwestern United States and Mexico. The seeds compare well with sunflower seeds and peanuts as a source of edible oil and protein, but they are not grown commercially anywhere.

One could, the report goes on to suggest, raise as many sheep in the desert as one can on the same amount of prime grassland if one imported a plant called tamarugo. Tamarugo is one of the few plants that can survive in Chile's salt-crusted Atacama Desert.

Right now the world's population depends on about 20 plant species to provide most of its food. This, the Academy believes, is dangerous, since such "mono-

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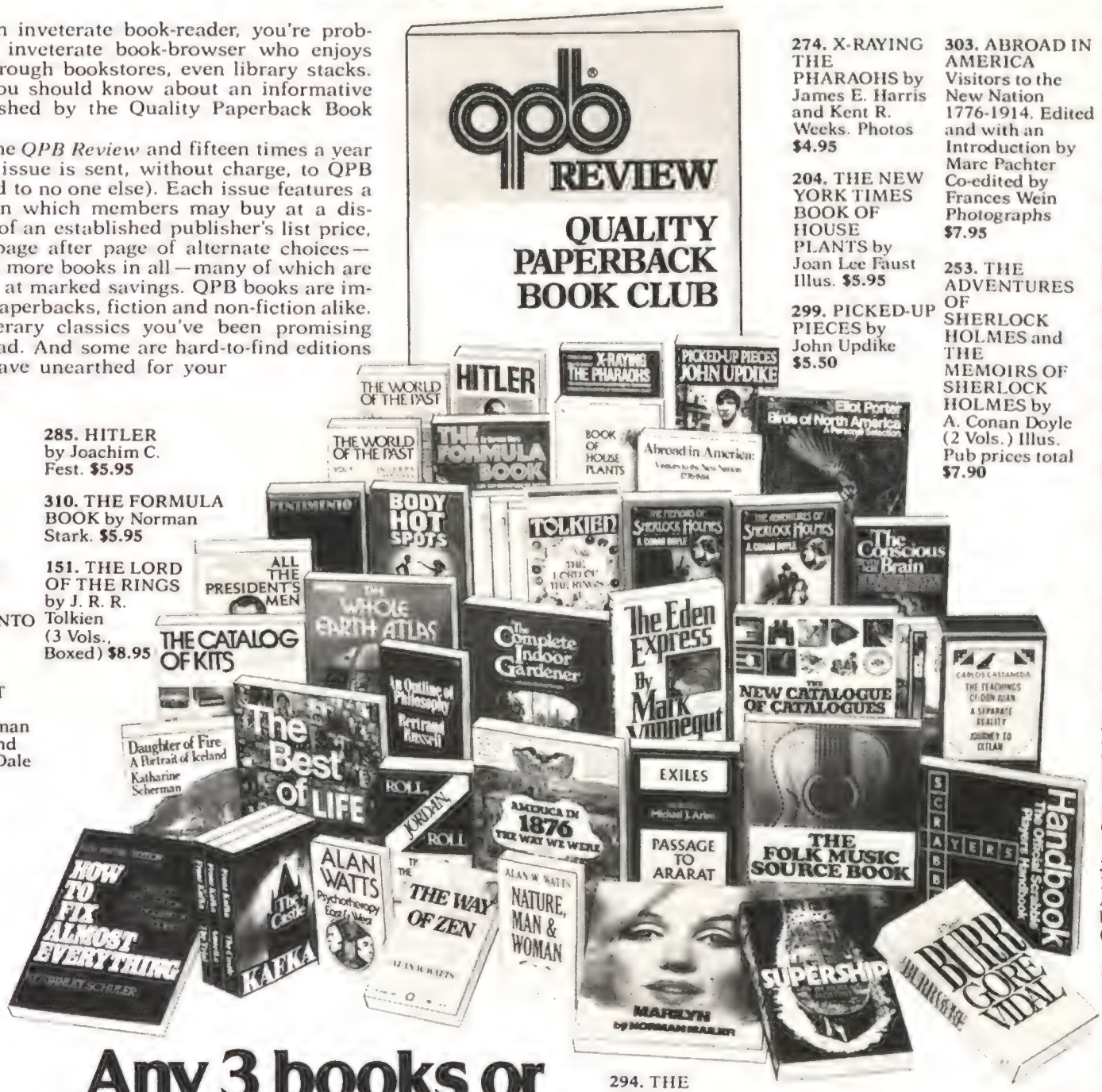
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The Bristol cover-up

It is established that Norsemen were the first Europeans to find this continent, but their settlements here were short-lived and they pretty well forgot about the place. But it appears now that other Europeans – specifically, Englishmen – were also here before Columbus.

A specialist in industrial and commercial history, one Forbes Taylor of Bristol, England, has been looking into that city's customs records dating back to the 1470s. According to the *Times* of London (April 15, 1976), there was, beginning in 1479, a strange shift in the patterns of cargoes in the trade between Bristol and Ireland. "There is a sequence of voyages, with which customs officers were associated, which lasted inexplicably long if they were indeed to Ireland, but not if they were voyages of exploration and later clandestine revictualling to a depot much farther west."

Instead of returning from Ireland with such things as salmon and linen, the ships of these long voyages returned with salt fish, white herring and hides. Mr. Taylor suggests that the long sorties were carrying stores to an outpost in southern Newfoundland, a depot providing shore services for clandestine fishing fleets on the Grand Banks.

Naturally, such a rich fishing ground was a valuable commercial secret to be kept from rivals. There is evidence of a cover-up plan in Bristol involving customs officials, and extending to the use of code names for the operation. It seems plausible, but what is needed to make this more than a fascinating theory is the discovery of some physical proof of the Bristol settlement in Newfoundland.

The Danish wind

Denmark is a thoroughly fuel-poor nation, relying heavily on Middle East oil and other imports. One answer is to go nuclear, which entails yet more imports—in this case, of uranium. But Denmark is one of the windiest places in all of Europe: winds blow over the flatlands nearly 300 days a year, and the longest windless period recorded is seven days.

So the Danish government is taking as serious a look at the use of wind generators as any nation. Downtime—when electricity is not being produced—is considered the main impracticality of wind power, but Berent Sorenson, a physics professor and a leading wind proponent in Denmark, has calculated that with a small storage system—good for 24 hours of calm—a wind generator has about the same downtime as a nuclear reactor, which has to be shut down periodically.

Sorenson hopes to plug wind generators into Scandinavia's power grid. Norway and Sweden are blessed with considerable hydroelectrical capacity, and, happily, the most windless times in Denmark coincide with the northern countries' late spring runoff.

It is now up to the Danish government to decide. By way of forcing the issue, the college community of Tvind is building a wind generator on its own. No normal windmill, this one will have a rotor consisting of two three-ton blades, each 27

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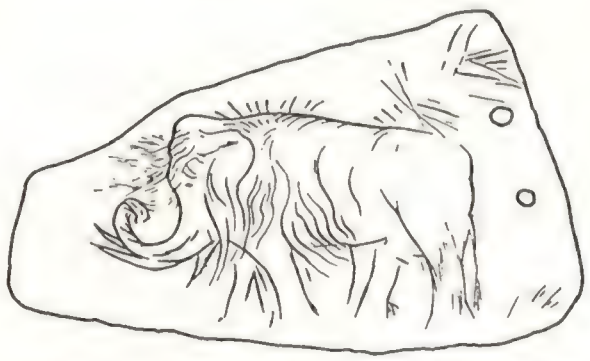
meters long, mounted on a tower more than 50 meters high. It will produce 3.6 million kilowatt-hours of electricity a year, equivalent to 400 tons of oil. As *New Scientist* (Volume 70, Number 1004) points out, the Tvind windmill "stands as a defiant *fait accompli* for 'soft' technology supporters everywhere."

No surprise

By way of reprise to an earlier item on the problems of garden slugs (June 1976), a reader, Kye Cochran, drew attention to a newsletter called *Tilth,* which is held in some esteem by organic gardeners of the Northwest. It reports on the activities of one daring farmer who seeks to rid his garden of slugs by eating them. Parboiled and sautéed with various spices, they still, it seems, taste "tacky."

Man and mammoth

In 1864, two men by the names of Cresson and de Suralt discovered, near the Holly Oak railroad station in northern Delaware, a piece of shell that had been fashioned into a pendant with what appeared to be a woolly mammoth etched into it. Claims were immediately forthcoming about the antiquity of early Man on this continent: the carved shell plus other bone artifacts suggested a date earlier than 8000 B.C. (maybe even 50,000 B.C.). But before long the Holly Oak pendant was cast into disrepute—it wasn't clear just where in the old sediments Cresson had found it, if indeed he had found it at all.



A Smithsonian drawing of the Holly Oak pendant, perhaps 100,000 years old.

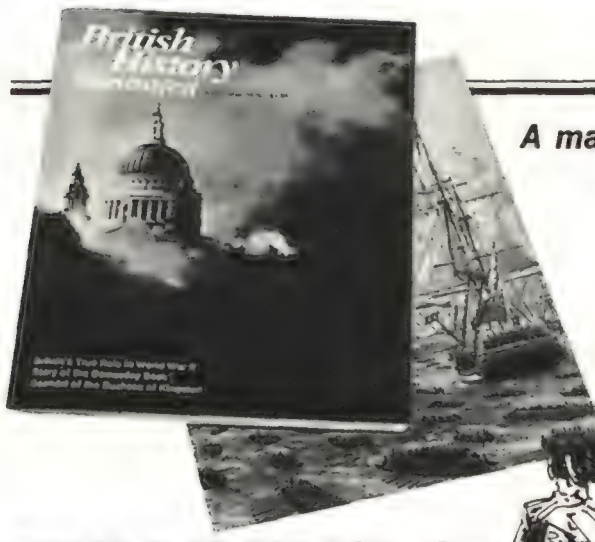
Recently Smithsonian scientists have laid to rest the dark rumors of fakery—the lines etched in the pendant have weathered just as much as the shell itself—and John C. Kraft, a geologist, and Ronald A. Thomas, an archaeologist, review the bidding in *Science,* (Volume 192, Number 4241).

Mammoth and mastodon remains have been found in sediments known to be some 10,000 years old, though not in any much more recent than that. But it is possible that the pendant was deposited in sediments which sophisticated geological techniques have dated at more than 40,000 years ago—perhaps as much as 60,000 to 100,000 years ago.

The two scientists suggest that it would be a good idea to return to Holly Oak and dig around for more evidence, but this is complicated by the fact that the area is mostly covered by Governor Printz Boulevard, Interstate 95 and the Penn Central Railroad.

But whenever it was that the pendant was carved, it serves as a reminder that, while we are feeling pretty full of ourselves for surviving 200 years as a nation, we took the place away from the original inhabitants. One would forgive the remnants of that ancient lineage, now salted away on reservations, if they declined the invitation to celebrate with us.

JAMES K. PAGE JR.



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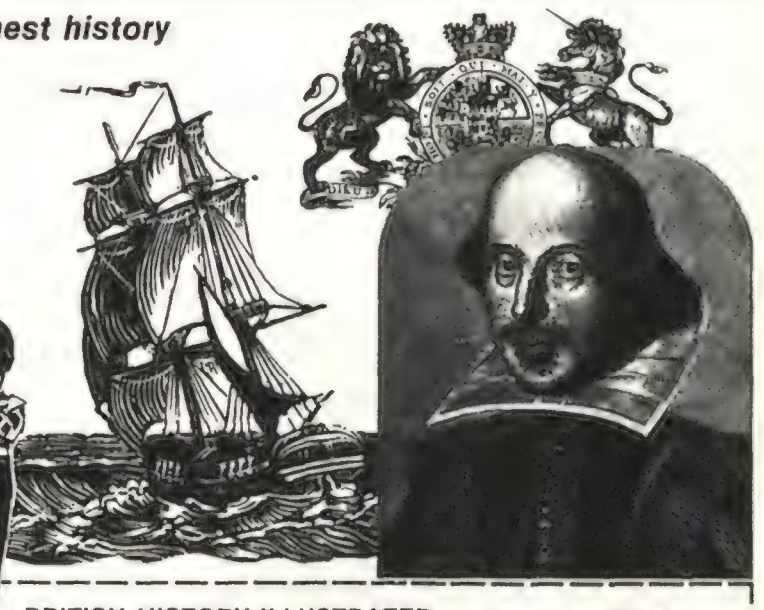

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Letters to the Editor

Truckers

Dear Sir: My reaction to your article on trucking to Prudhoe Bay in the June issue is: "subculture," indeed! A lot of Alaskans, watching their cherished way of life shattered forever, regard the truckers' "subculture" as sometimes subhuman. I've had to compete for road space with some of the 18-wheelers and am beginning to share the opinion of those who regard truckers as murderous, arrogant lunatics who should have stayed in Texas. The truck nicknamed "Moose Killer" pictured in the article aptly expresses their state of mind. If it gets in the way, run it down. Can you really look at that photograph of the magnificent Brooks Range with its foul cache of pipe in the foreground and not weep a little?
Judith Holland
Fairbanks, Alaska

Dear Sir: I found David Snell's article on truckers to be particularly interesting. Delivering the freight from Houston to Prudhoe Bay in 16 days is positively phenomenal. It speaks well, not only for the rugged personnel who man the big trucks, but for American know-how, which designed and manufactured rolling equipment that can function in temperatures registering 40 or 50 degrees below zero.
Dr. A. E. Alexander
New York City

Dear Sir: The truck driver, Andrew B. Coalson jr., with whom Mr. Snell rode on the trip to Alaska, has been awarded the highest honor this segment of the trucking industry can give a driver—the Oil Field Haulers National Driver of the Year Award [at right]. He was chosen from a field of 112 drivers who were nominated by their respective employers for this annual award.

Junior Coalson has almost four decades of professional truck-driving experience, all without accident involvement or a police traffic citation. Since making the trip described in SMITHSONIAN, he has made four additional accident-free trips from Houston to Alaska.
Charles T. Stamp
Director of Safety and Compliance
Oil Field Haulers Association, Inc.
Austin, Texas

Accompanied by his wife, Coalson proudly holds his safety award trophy.

Custer painting

Dear Sir: If Luther North were still alive to see your article on the new Custer painting, this letter might be from him. "Lute" fought Indians with General Custer, and the numerous posters of Custer's last stand were his pet peeve.

North was an old crony of white-haired Congressman Edgar Howard, who was editor of the *Columbus Telegram* in Nebraska, where I worked in the 1920s. Lute and many aged Indians often came into the *Telegram*'s office then to see the Congressman. The Indians would seldom talk to anyone else. But Lute welcomed every opportunity to tell youngsters how the West was really won, praise the Indians, and denounce Anheuser-Busch.
Volta Torrey
Washington, D.C.

Dear Sir: When I saw your article, it was the first time in 65 years I had gazed on *Custer's Last Fight*. On the Lower East Side of New York City, along Second Avenue, there was a saloon on every corner—each featuring a different brewery.

Every time I walked by the Anheuser-Busch saloon, my eyes would fill with tears as I saw my hero and the 7th Cavalry killed and scalped. It was many years later after the debunkers began their reign that I realized my hero did not quite live up to his reputation.
Joseph Geschelin
Hallandale, Florida

Dear Sir: Author Eric von Schmidt cites "Regulations of 1877 at Fort Lincoln, Nebraska" in discussing clothing of the 7th Cavalry. Surely he meant the post, Fort Abraham Lincoln, located in Dakota Territory near Bismarck in present North Dakota. Its foundation markers still exist at Fort Lincoln State Park.

Aside from this point, I was fascinated by Mr. von Schmidt's undertaking. I, too, grew up with the Anheuser-Busch version of the battle—in Michigan, where Custer was more highly regarded than he is here. The author should be commended for his approach to the subject, which seems to have clarified details rather than taking sides in the never-ending argument.
Mrs. Paul Ahlness
Bowman, North Dakota

Dear Sir: Three cheers for Eric von Schmidt. His painting is a wonderful example of what can be achieved through a carefully executed mix of art and history. As an artist by profession and a devoted historian, I can well appreciate the labor involved in its planning and execution.
Kenneth G. Petrie
Gaithersburg, Maryland

Dear Sir: Mr. von Schmidt's painting of Custer's battle is superb but he apparently forgot to include the one participant that can still be seen today—Captain Myles Keogh's horse Comanche [p.47].

The severely wounded animal was found on the battlefield and finally taken to Fort Riley, Kansas, where it recovered and lived out its days in honor. It now carries the 7th Cavalry's colors at the Museum of Natural History of the University at Lawrence, Kansas.
Jerry L. Kagele
Ritzville, Washington

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The Night Watch

Dear Sir: Maureen Green's article, "*The Night Watch* is now restored to glowing health" was outstanding. How nice it is to know that this monumental work has been brought back to its original beauty. I did a double take at your opening color illustration—for all the world this looks like a Robert Rauschenberg painting of the 1960s.
Reed Hoover
Dallas, Texas

Loch Ness 'monster'

Dear Sir: I do believe in the Loch Ness "monster," even if the pictures don't show a very clear image. However, I won't be fooled into believing that George R. Zug really has people in his shirt, even though their images are crystal clear.
Cindy Butler Jones
New Carlisle, Ohio

Dear Sir: In our opinion, the "monsters" in Loch Ness should be left alone. There should be some unsolved mysteries left on this planet to intrigue people.

Long live Nessie, in undisturbed peace!
Virginia, Carole and Donald Vilas
Silver Spring, Maryland

Dear Sir: Sir Peter Scott's suggested name for Nessie, *Nessiteras rhombopteryx*, is an anagram of "Monster hoax by Sir Peter S."
K. P. Carroll
Winthrop, Maine

Bicentennial guide

Dear Sir: I have detached Meredith White Riegle's Bicentennial guide, "Summertime at the Smithsonian," and will keep it with me all summer.
Aida Bound Page
Washington, D.C.

Centennial exhibition

Dear Sir: Lynne Vincent Cheney's article in the May issue whetted my appetite to know more about the 1876 exhibition. Is there a catalog to accompany the show that an out-of-towner might buy?
Elaine Hood Hill
Menlo Park, California
A catalog, 1876: A Centennial Exhibition, *published by the National Museum of History and Technology tells in detail the story that Lynne Cheney told in brief. Copies may be ordered by writing:* 1876, *National Museum of History and Technology, Smithsonian Institution, Washington, D.C. 20560. The price is $7.45.* Ed.

Lindbergh's Jenny

Dear Sir: Perhaps author Jack Keasler and your readers would be interested to know the fate of Charles Lindbergh's first aircraft, a Curtiss JN4D Jenny. The plane was sold and resold before it crashed in 1927, and what was left was stored in a barn in Coggon, Iowa.

Were it not for the efforts of George C. Dade, president of the Long Island Early Fliers Club, it would still be gathering dust in that Iowa barn. Dade organized "The Jenny Works" and, with the help of volunteers, rebuilt the plane.

On November 9, 1973, 50 years after he had sold it, Lindbergh visited "The Jenny Works" and saw the remains of his first aircraft. It is unfortunate that he didn't live long enough to see the carefully rebuilt Jenny.
William K. Kaiser
Curator, Air and Space Collections
Nassau County Museum
Syosset, New York

'No tears about tears'

Dear Sir: Many things benefit from Patrick Ryan's wry touch of humor, but his May column was neither funny nor enlightening. It was offensive.
Wendy R. Drake
Santa Monica, California

Picture credits

Cover Stephen Green-Armytage; 6, 7 Dick Swanson; 17 courtesy George Robert Lewis-*Science* Vol. 192; 18 Robert Westerlage; 22-29 Rex Weyler; 30, 31 Rod Ruth-National Oceanic and Atmospheric Administration; 32, 33 Suresh Vasant-The Asian Art Archives of the Universty of Michigan; 34, 35 I. Job Thomas; 35 L. J. Majewski; 36, 37 I. Job Thomas; 38 left I. Job Thomas; Suresh Vasant-AAAUM; 39, 40 Suresh Vasant-AAAUM; 41 I. Job Thomas; 44, 45 Stephen Green-Armytage; 46 top Chicago Historical Society, The Western Reserve Historical Society, American Morgan Horse Association, Inc.; 47 Dennis Brack, American Morgan Horse Association, Inc.; Stephen Green-Armytage; 48, 50, 51 Stephen Green-Armytage; 54-57 Francis & Shaw, Inc.; 58 Pierre Mion; 59 Greta Fryxell, courtesy Dr. Athelstan Spilhaus, Pierre Mion; 60-63 Francis & Shaw, Inc. (computer computational assistance by Richard Furno, Norman Guinasso, John O'Keefe and John Ward); 64-73 Dmitri Kessel; 74, 75 Marvin E. Newman; 75, 76 Paul Brooks; 77-81 Marvin E. Newman; 82-89 Dmitri Kessel; 91, 92, 93 Score Photographers-Wells Fargo Bank; 104 Mike Ramus.

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By Matt Herron

A not-altogether quixotic face-off with Soviet whale killers in the Pacific

Manning a high-speed Zodiac inflatable boat, two Greenpeace demonstrators approach a Soviet whaling factory ship flanked by two menacing-looking whale-killer vessels.

Photographs by Rex Weyler

'Ahab's Children,' in the form of a crew of courageous idealists on a creaky boat, interpose themselves to foil the harpoons

The sun was turning the tops of the gentle Pacific swells a delicate gold as the amateur crew of the Canadian Greenpeace Foundation vessel, *Phyllis Cormack*, awoke to its 58th day of fruitless searching for the Soviet whaling fleet. The mission—obstructing the whalers by interposing their bodies between the harpoons and the great beasts—could not go on much longer. The *Cormack*, an 80-foot halibut seiner, had been at sea too long. Fresh vegetables, canned juice, coffee and cigarettes were long gone; water was on short ration. A diesel spill in the main hold had contaminated staples. The bread tasted of diesel fuel; so did the brown rice. And on a spring day in 1975 the Russians were nowhere to be found.

In London the sun that warmed *Phyllis Cormack*'s crew was casting afternoon shadows into the delegates' lounge where the International Whaling Commission was winding up the first day of its week-long annual deliberations. Delegates from the 15 member nations were very much aware of the *Cormack*'s mission. Paul Spong, the Vancouver scientist who had done much to set the whole protest in motion, was describing the plight of cetaceans to an attentive press, but despite the talk, Greenpeace was not taken very seriously. Few delegates believed the Canadian boat would ever get within 100 miles of a Russian or Japanese whaling fleet. It was a very big ocean.

Big indeed. All spring the Japanese fleets had never ventured closer than 1,200 miles to Canadian shores. But now, off the coast of Eureka, California, the protesters found evidence that the Russians *were* tantalizingly close. For two weeks Al Hewett, guiding genius of the mission's complicated electronics, had been picking up Russian conversation on the *Cormack*'s old radio. At first he would urgently summon the Russian interpreter, George Korotva, to the wheelhouse, but every conversation proved to be Soviet draggers dis-

Bob Hunter, Greenpeace's project director, hangs in *Cormack's* shrouds, looking for Russians.

Crewman Paul Watson perches on dead baby whale, flagged by Soviets, and finds it's below legal length.

cussing nets and trawls and government catch quotas. Eventually Al piped the talk through a speaker in the galley where George spent long hours slumped in a corner, his face a mirror of the depression that was settling over the entire crew. Unless the whaling fleet could be found and challenged within the next few days, all hopes of influencing the IWC proceedings and perhaps forcing a moratorium on whaling were doomed to failure.

A week of signs and portents followed. Nobody knew exactly where the Russians were. The moon waxed full, and one evening, apparently overcome by its influence, the entire crew stood on the foredeck howling like werewolves as it rose directly in their path. Helmsman Mel Gregory drove the *Cormack* directly down its silvery path until the doughty skipper of the boat, John Cormack, came to the bridge, found Mel pointed ecstatically moonward, 25 degrees off course, and hauled him off the wheel by his beard.

This year, Matt Herron took part in another Greenpeace voyage. He is the author of Aquarius, *a tale about blue-water sailing with his family.*

Halfway around the world in London, the IWC began to end its meeting. For the third year the convention voted to table an American resolution calling for a ten-year moratorium on all whaling. The members agreed to a ban of sorts but conservationists saw merely the traditional strategy of reducing kill quotas in step with the world's dwindling whale population.

Then, on Thursday evening, George leaped off the galley bench with a roar, spilling his coffee and shouting, "That's them, that's them!" This time the signals seemed near and clear, and Al was able to get an accurate radio direction fix. The *Cormack*, then 150 miles off Cape Mendocino, California, turned east toward shore. It was a night of heavy seas and the gray blotches that appeared on the horizon at dawn seemed hardly worth investigating. An hour later came a shout: "Whalers! Holy Christ, they're whalers!"

There could be no mistaking. On the horizon lay the factory ship, easily 450 feet long, dwarfing its fleet of nine harpoon boats. No other boats had the look of these killer boats—ugly, low-cut, each with a harpoon cannon mounted high in its bow, a long elevated catwalk connecting the gunner directly with the bridge

George Korotva, interpreter for the Greenpeace venture, plays a violin on *Cormack's* bridge.

"Walrus" Oakenbough, ship's cook for Greenpeace, takes a turn as lookout for the Soviet whalers.

amidships. Like hounds they circled the middle distance as if casting for a scent. Their shapes were familiar to the crew from the photographs studied so many times, yet the actual physical presence of those gray scavengers on the sea before them seemed more a dream than a reality.

Now "Ahab's Children" prepared for battle. On the bridge, John Cormack pushed the big Caterpillar diesel up to maximum revs. Down in the bunk room frantic hands clawed film gear out of waterproof boxes. Still-photographer Rex Weyler loaded the cameras; the film crew checked light meters, batteries and motor drives. On the afterdeck the crews of the Zodiacs (high-speed inflatable boats) stripped down, forcing chilled bodies into clammy wet suits. For the hundredth time George Korotva and Carlie Trueman, the only woman aboard, checked the outboards. On the main hatch, Bob Hunter, project director, taped his impressions.

They sighted the first dead whale long before they reached the killer boats: a tiny blue-gray hulk awash in the gentle swells, its position marked by a radio transmitter and a radar reflector floating nearby. "My God!" Carlie cried, "It's only a baby." And so it was.

Year by year, the size of the individual whales killed has declined dramatically. The octogenarian whales, grandfathers and grandmothers, are mostly dead; the mature adults are greatly reduced; more and more the whaling fleets have been forced to turn their harpoons on youngsters. In 1932 the average male sperm killed weighed around 47 tons; today less than 30.

John Cormack pulled up near the dead baby and two Zodiacs were put in the water. From one, Paul Watson climbed astride the dead animal to provide a reference for measuring it. One of the killer boats wheeled away from the hunt two miles off and bore down at high speed.

Paul said later that the baby's skin "was warm and oily, the blood that flowed from a gaping wound hot on my hand. I stroked the flipper, reached toward the vacantly staring eye and closed the eyelid. I felt lonely upon the ocean with that dead whale child."

On the bow of the rapidly approaching chase boat the Russians prepared a high-pressure fire hose. In this first encounter neither side knew quite what to expect. The whalers, apparently ignorant of Greenpeace and its mission, seemed to suspect whale rustling. The crew of the *Cormack* was unsure how aggressively the Russians might react. John swung the blunt wooden bow of his old boat head-on to the approaching vessel and the Zodiacs were hurriedly called home. It seemed senseless to risk hosing down expensive camera equipment so early in the game. The whaler veered off sharply, less than 50 yards from the *Cormack*, and rounded up next to the dead whale where its crew frantically prepared the carcass for towing. In their haste they fouled a cable and snapped the jaw of the whale with a sickening sound. The chase boat then set off toward the mother ship with the whale lashed alongside, its unhinged jaw flapping grotesquely as the boat picked up speed. The *Cormack*'s crew agreed on the baby's size—about 20 feet, less than the legal limit.

Close up, the factory vessel *Dalyni Vostok* appeared like an industrial city, equipped completely to process thousands of whales and maintain herself, her crew and her fleet of chaser boats at sea for months on end. A hot, fetid smell of blood and entrails wrapped her like a nauseating shroud, followed her as she moved and forced several queasy Greenpeacers to the after rail. From a four-inch pipe at her waterline, blood gushed like sewer water—a never ending macabre fountain that stained the waters. A light misty steam rose from the surface and droves of sharks wheeled and snapped in the crimson broth. Astern, *Vostok* towed a pod of dead whales, replenished from time to time with the latest kill. Every few minutes a trailing carcass would be winched through the gaping portal in her stern and drawn up a ramp to the flensing deck where the butchering went on continuously. Great hooks lifted tons of meat and blubber high above the deck and fed them into boilers to be rendered into oil. It was a scene from a clockwork inferno: decks running red with blood and entrails, squeaks and groans from the donkey engines, smooth shapes of whales disintegrating into efficient piles of gore.

Friendly waves from the Russians

The Russians crowded the rails gesturing and shouting. They seemed at first to take the *Cormack* for some sort of weird excursion boat, or maybe a company of bizarre film makers—obviously a welcome diversion. There were friendly waves from the upper deck where tanned workers and girls in bikinis played volleyball.

Then George opened up from a loudspeaker on the *Cormack*'s bridge deck. There was a quality in his voice that reflected the scene before him, and perhaps the years he had spent in a Siberian coal mine. "We are an international group of environmentalists who oppose the killing of whales," he said in fluent Russian. "We speak for the 53 members of the United Nations that voted in 1972 for a ten-year moratorium on all whaling. We ask you to stop killing whales at once, to leave this business, to convert your fleet to other uses. If you do not, we intend to do everything within our means to prevent you."

The Soviet crew reacted like almost any group of factory workers confronted with an unexpected political message—that is, they hardly reacted at all. But from the *Vostok*'s bridge the response was unambiguous. The captain had been watching the *Cormack* intently through binoculars, and now in Russian he shouted a terse reply: "---- you!"

For nearly three hours the *Cormack* paced the *Vostok*, its Zodiac teams filming every visible aspect of the operation. By midafternoon the filming had been com-

Factory ship *Dalyni Vostok* tows dead whales astern, winches them through transom for processing.

pleted and the *Cormack* turned to follow a departing killer boat. It was time for trying the experiment: blocking harpoons with bodies.

The *Cormack* was hopelessly outclassed by the 150-foot steel harpoon boats, nearly twice her length and speed, and on one occasion a chase boat pulled up rapidly from behind, veering only at the last moment to skim past the *Cormack* at 15 knots, barely 30 feet off the port side. Casually, the Soviet gunner swung his harpoon cannon, aiming it directly at the crew on the *Cormack*'s bridge. The dark-clad Russians jeered as they swept past, cutting in directly across the fishing boat's bow, then bearing off 25 degrees to port, leaving her wallowing in a very big wake.

The sun dropped low in the sky. Another whale was attacked. The *Cormack* raced toward it, arriving too late to prevent the kill. For the Zodiac crews waiting in their wet suits since early morning, the day dragged on like a nightmare. Then, from the masthead, a shout. Several miles off a large pod of whales was fleeing from a harpoon boat. It was 7:30 P.M. now, and there wasn't a hope of catching up with the chase, but as the Greenpeace crew watched, the whales wheeled, almost as if sensing refuge, and made directly toward them.

Now action. The Zodiac crews scrambled for the afterdeck. Two months of rehearsing counted for seconds now. Winches whirred, the boats dropped in the water. The crews threw in outboards, life preservers, cameras. No more slow-motion nightmares: they were spinning away in less than three minutes.

Up front, racing for the harpooner at 20 knots, Bob Hunter and Paul Watson hung desperately to the sides of their boat in the pounding waves.

Bob says: "We could see the whales—sperms—blowing in unison as they broke wildly to the surface, their blowholes as large as manhole covers blasting out fountains of spray, their humps thrust like glittering black shoulders. Even when they were still half a mile ahead, with the shriek of the outboard engine cutting through my brain, I could hear distinct, tremendous gasps coming from them."

Between whale and gun

In ten minutes Bob and Paul caught up with the harpoon boat, passed it and swerved in front of it. The burly harpooner and his mate, the whale spotter high in the crow's nest, the six officers crowding the bridge—all looked down in bewilderment. Now the Zodiac pounded ahead into that circle of danger they had come so far to find—the brightly barbed harpoon behind, the wildly thrashing sperms ahead. Spontaneously Bob and Paul reached out and clasped hands. "We're here. It's happening. We're doing it."

Paul peered ahead, trying to keep the whales in line, trying to push as close as possible without actually driving up on their backs. At the Zodiac's nose, Hunter looked back at the rusty bow of the chase boat *Vlastney*, rising and falling like an ax blade over Paul's shoulder. The harpoon cannon swiveled back and forth like a sensitive antenna each time the whales surfaced in a new position and the ship changed course. Flanking the Zodiac and slightly to the rear were the two Greenpeace camera boats: Rex braced hard against the bow rope of one, his Nikons at ready, and George at the outboard, grinning like a wild man. In the other boat were Fred Easton and Pat Moore.

Suddenly Paul's outboard died. As the *Vlastney* came knifing down on them, Paul leaped to the crippled engine, swearing and yanking at the starting cord. The engine coughed, caught, shoved them sideways and died again. The *Vlastney*'s bow wave threw them safely aside. They could have touched her as she swept past.

High above, crewmen laughed and the captain leaned far out from the wing of his bridge and drew a forefinger lightly across his throat.

Spinning wildly in the wash of the big screws, Bob and Paul pounded their boat in fury. But the other Zodiacs were alongside them in seconds. "Get in! Get in!" George roared, and Bob leapt aboard.

Off again. George overtook the *Vlastney* and moved into a good position right behind the whales, close enough to block a clear shot, so close, in fact, that he had to slow to keep from overrunning them. The whales were blowing every few moments, too tired and short of breath now to dive. Their great blue-black humps churned, their spouts kicked up scores of rainbows. It was so beautiful and terrifying, Hunter reported, that his eyes misted for a moment. Behind them, the Soviet gunner, deprived of a clear shot and confused by the Zodiac's maneuvering, stepped away from his gun. Clearly there was indecision on the Russian vessel. Meanwhile, Paul was able to rekindle his outboard and take up a good camera position. A messenger ran the *Vlastney*'s catwalk from bridge to bow, and shortly the gunner stood to his weapon.

George: "Bob was looking over my shoulder and suddenly I saw his face grow so very long—maybe four feet long—and right away I knew, they're going to shoot. They're really going to shoot!"

No time to react. The Zodiac dropped on a wave, the whales rose on the following one. From the bow a puff of smoke and a crash. The gun went off like an artillery piece sending a 250-pound harpoon with exploding warhead directly over the Zodiac and into a whale ten yards beyond. The whipping cable sliced into the water not five feet from the side of their boat. Instinctively, Korotva and Hunter ducked.

Then came the scream of the stricken whale as the shrapnel grenade exploded deep within her, shredding muscle, bone and guts. She dived and came up at once, thrashing helplessly in the water. She was crying exactly like a baby. Blood poured out of her.

Months before, Paul Spong had warned the crew to get away fast from a dying whale. When one of his harem is struck, the bull whale is taken with a terrible rage and will charge the nearest enemy.

George: "I turned that Zodiac and we just got the hell out of there, hauled ourselves to the *Cormack* as fast as we could go. I looked back and that bull was coming like a great black locomotive. He was half out of the water, throwing sheets of spray in every direction. It was a terrible sight. But then I realized he wasn't following us at all. He was making straight for the whaler and he seemed to know his enemy wasn't that iron boat but the man standing high in the bow. He never even touched the boat, he went directly for the man. Lunged straight up in front of the bow, throwing himself nearly out of the water. He was snapping and gnashing his teeth, trying to get at that man. I've never seen anything like it. The harpooner reloaded his gun so calmly. Then he dropped the muzzle down until it was nearly vertical and just blasted the whale point blank. The bull made one dive under the boat and came up dead."

Bob and George sat in the Zodiac and wept.

A song to heal the anguish

Mel threw back his head, cradling his guitar and a song poured forth unrestrained, a dozen voices raising it high above the *Cormack*'s crowded galley, washing away the anguish and tension of yesterday's action. The voyage of Greenpeace was nearly over, Ahab's Children nearly ready to go home. Against all odds they had found the whalers. And they had saved a few whales. The eight survivors of yesterday's pod of sperms would certainly have died were it not for Greenpeace. Today the Soviet's efficient operation had turned ponderous under their goading. The whalers, afraid to leave dead whales unattended as the *Cormack* wheeled among them, had begun towing the animals back to the mother ship one by one as they were killed, allowing many others to escape. By tomorrow, when the fleet would finally pull beyond range of the *Cormack*'s radar, they would be 300 miles south of the whaling grounds.

It was Saturday evening, June 28. The 1975 IWC meeting in London had broken up, the delegates were flying home, but not before news had reached them of the skirmish off Eureka, California. Its meaning would not be lost on them. For the first time men had put their lives on the line to save an endangered band of animals. It was a unique bonding, and it would surely happen again.

Like raw steaks on a butcher's counter, whales lie on *Vostok*'s deck awaiting rendering.

Blood sluices from factory ship's innards as gigantic carcasses are cut up and boiled down.

The general problem for aquatic creatures

Militant confrontation with whalers, as epitomized by the Greenpeace adventure, does serve to highlight the continued—but legal—slaughter of great numbers of whales by the USSR and Japan. This admission by Dr. Robert M. White, Administrator of the National Oceanic and Atmospheric Administration, does not mean that there is American sanction for such tactics as Greenpeace's, but it reflects interest in conservation of whales.

On his return from the 1976 meeting, in London, of the International Whaling Commission, Dr. White was able to report an overall improvement in the prospects for continued survival of most whale species. At the 1975 meeting, both Japan and the Soviet Union had agreed to abide by the Commission's quotas, and filed no objections as they had in earlier years—an encouraging note, especially in view of the importance of whale products to the economies of both nations. Now, on all oceans, the quotas for the killing of whales have been reduced from 32,500 to about 26,500. Most of some 6,000 whales that will be saved are the big ones: sperm, fin, sei and Bryde's.

In the North Pacific, where Greenpeace is active, fins and seis remain protected, Bryde's and both male and female sperms come under considerably lower quotas than last year and a quota has been established for minke whales, which had no quota last year.

In the North Atlantic, a few less fins will die, also a few less minkes. Quotas also have been set up for seis and sperm. Bryde's are not found here.

In the Antarctic, fin whales at last come under full protection, and seis have a reduced quota. Male and female sperms enjoy greatly reduced quotas—from 4,870 females last year down to 897. As a bargaining point, minkes in Antarctic waters now get less protection. Whalers can take 8,900 of them rather than 6,810 last year. Minke whales are the smallest of the great whales and have not been particularly exploited.

Dr. White says that the IWC seeks to strike a compromise between nations such as the United States, Mexico, France, Argentina and New Zealand, who wish to see all commercial whaling come to a halt, and other nations which look upon whaling as a necessity because of the food and materials derived from the great mammals. Obviously, the many whaling nations which are not members of the Commission pose a frustrating problem for enthusiastic preservationists.

Whatever conservation measures are taken cannot come too soon for fin whales and sei whales. Fins in the Antarctic were estimated at 480,000 before they were exploited. The estimate now is fewer than 100,000. Atlantic and Korean grays and the North Atlantic rights and blues are extremely rare, if not extinct.

Many smaller whales have teeth and prey on fish, seabirds and smaller sea mammals, but most great

Courtesy National Oceanic and Atmospheric

whales are baleen whales whose mouths are fitted with baleen plates which filter krill—small crustaceans—out of sea water. Graceful, playful, generally gentle, all great whale species have been hunted to the bitter edge of extinction for their oil, meat and bone. The United States was once the leading whaling nation, and reminders of our preoccupation crop up in New Bedford and Nantucket. Five years ago the last U.S. whaling station was closed.

Galaxy of sea mammals in scale

Whales, largest mammals on Earth, dominate the list of sea mammals that includes seals and other pinnipeds, manatees, sea otters and polar bears. Huge as they are, baleen whales feed on krill, shrimplike organisms shown in circle at one-third natural size. Mighty blue whale is the largest of all, stretching some 100 feet. It and seven other great whales—bowhead, right, humpback, fin, sei, sperm and gray—have been on the American Endangered Species list since 1971.

Administration, painted by Rod Ruth

By Madhur Jaffrey

Ancient beauty of Ajanta's painted caves is restored

After centuries of neglect, India's richest repository of Buddhist art emerges into the world—but parts are restricted

The eerily lovely painted caves of Ajanta, in India's western state of Maharashtra, as shown in the accompanying photographs, are as wondrous a relic of the subcontinent's past as is the Taj Mahal—and almost as irresistible a tourist attraction. But as treasure vaults of ancient art they were in dire need of restoration. Accordingly, four of the 30 caves—numbers 1, 2, 16 and 17—have been closed two years for cleaning and conservation. Soon all but No. 17 may reopen, basic work being completed.

Guards have been posted outside the padlocked gates. All day, they have been importuned by busloads of sweating tourists who, having taken the 66-mile road from Aurangabad and climbed the seemingly endless steps up the precipitous basalt cliffs, demand to see *all* of the paintings in *all* of the caves. Those who have read up on the subject know that some of the rarest and most exquisite paintings are on the walls of off-limits caves. But the guards have been there to say no, implacably, on orders from on high in the government of India. And so they have, and so the tourists, some retreating in tears, have had to content themselves with walks through the 26 remaining—many almost equally magnificent—Ajanta caves.

How the caves were painted, why they have fallen into decay and disrepair, and what is being done to preserve them is a long and unusual story that began 200 years before the birth of Christ.

Gautama Buddha (c. 563-483 B.C.) had already lived and died in northeast India. He had come to the

The mythical Prince Mahajanaka, attended by the beauties of his court, receives a lustration (ritual

purification) from two menservants who hold water jars over his head. The scene in his pillared palace is painted on wall of the interior hall of Cave No. 1, carved out of a hillside at Ajanta.

Photographs by Suresh Vasant, I. Job Thomas and L. J. Majewski

The long-forgotten caves, cut in a remote valley wall, were found in 1819 by British officers.

A frieze of Buddhas (bottom) in Cave No. 2 overlooked devotees

conclusion that the cause of all earthly torment was desire, and that even after Man died, his self-perpetuating desires lingered on, causing him to be reborn—to want and suffer all over again. Salvation lay only in nirvana, which for Buddha meant freedom from the cycle of rebirth—total extinction. To achieve this, he recommended a life of austerity, abstinence and inner discipline. He founded an order of mendicant monks who set out to preach the new gospel.

By the second century B.C., Buddhism had spread over most of India. Monks, well-endowed with contributions from wealthy merchants and princes, began searching for silent, remote locations in which to meditate, practice self-discipline and teach during the rainy season. In the Inhyadri Hills in the west they came across a deep, curving ravine. The river Waghora flowed at the bottom of this ravine, having first taken seven pretty leaps from the top of the cliffs. The cliffs, horseshoe in formation, rose sharply and forbiddingly like a wall along one bank of the river. The volcanic rock here had deep erosion pockets in it, forming natural shelters from the elements. The Buddhist monks decided to move into the caves. But they did much more than just live in them. Armed with their donated funds, religious zeal and infinite patience, they had their craftsmen burrow into the cliffs and excavate, or rather sculpture, the inside of a whole house of worship (*chaitya* hall) complete with vaulted ceiling, two rows of octagonal pillars and, at the inner, apsidal end, a large, dome-shaped memorial shrine.

The excavation was not haphazardly undertaken. The site was chosen because it was on an ancient north-south trade route and near fresh water. Architects, sculptors, carpenters, painters and laborers were employed. Since most buildings of the period were made of timber, the design of such constructions was copied in stone. To minimize the use of scaffolding, excavation started at the ceiling and worked downward. As the carvers, with hammers and chisels, finished their work, the stone surfaces—walls, ceilings and pillars—were prepared for painting.

Because of chisel marks and gas cavities, the carved surface of the rock was not at all smooth. This was remedied by an initial coating of plaster, one-eighth to three-quarters of an inch thick, consisting of a mixture of reddish-brown earth, clay, pulverized rock, cow dung, hay, husk and grass. Over this coarse layer a thinner one, composed basically of the same materials, but pounded even finer, was generally applied. Finally the plaster was given a wash with lime. When the lime was dry, the artists were free to paint. Most of their colors they found in their own front yard, so to speak.

The exposed and aging basalt cliffs contained glauconite, which made for a nice, dull emerald green. Ocherous clays, ranging from pale yellow and orange to reds and browns, were present. The artists' white was lime, kaolin or gypsum. Their black was lampblack, made by burning oil and collecting the soot in a container held over the flame. These basic colors could be combined to produce a vast range of shades. In order to make the colors adhere to the plaster, a vegetable or animal glue was mixed into them. Master painters often would draw outlines in deep red or black, which could then be filled in, with adequate shading, by their assistants.

The purpose of the paintings was to inspire the

who once prayed here under
a ceiling of birds, fruits, flowers.

Partly restored wall in Cave 17 shows up beside
uncleaned part. Lioness was mother of King Saudasa.

monks and students with the wonder of Buddha's teachings. Their subject was Buddha's life, as well as the *jatakas*—tales of his earlier incarnations. In his previous lives, Buddha had been born in various forms —sometimes as man, sometimes as a bird, sometimes as a beast. Whatever shape he took, he was always a *bodhisattva* (the essence of wisdom), capable of nirvana but choosing not to achieve it in order to help others. During this early phase of Buddhism it was considered sacrilegious to show Buddha in sculpture or painting. He could be represented either in symbols or in one of his earlier incarnations. The walls of the new *chaitya* hall were covered with these Buddhist themes.

During the first century B.C., there was an upsurge of cave excavations all over the hills in western India. At Ajanta another *chaitya* hall was excavated, as well as three monasteries *(viharas)* with cells for the monks.

The next four centuries, apparently, saw no major changes at Ajanta. Meanwhile a new school of Buddhism, the *Mahayana* school, had developed. The austerity of the earlier Buddhists was not to everybody's taste. So Buddha and the *bodhisattvas* were deified, image worship was introduced, and popular gods and goddesses from Brahmanic or local sources soon found their way into Buddhist iconography. To the slightly forbidding concept of total extinction was added—in some contradiction—the pleasing possibility of a blissful paradise, full of flying angels and nymphs.

All this was to be reflected, gloriously, in the caves at the Ajanta site, their grand designs, formulated centuries earlier, still intact. With vast funds donated by ministers, princes and traveling foreigners, the painters added a new, expensive color to their existing palette—blue, made from Persian or Afghan lapis lazuli.

Walter Spink, professor of Indian Art at the University of Michigan, who has been working more than a decade on a detailed analysis of the caves, believes that all the remaining excavation and painting at Ajanta was done, in one spate of furious activity, from about A.D. 460 to 480. Many scholars agree with him, while others think that work was resumed then, but continued over the next 200 years. In the four closed caves, looming statues of peaceful Buddhas, carved in the dark inner shrines, first were given the thinnest coating of plaster and then painted with bright colors. Ceilings were covered with flowers, fruit, birds, beasts, drinking foreigners and lovers flying through the skies —various groupings neatly enclosed in rectangles and expanding circles. The walls were painted as before with popular Buddhist themes, but the style of the new paintings had become flowing, lively and extremely sensuous.

In Cave 1, for example, a scene had to be painted showing the miracle of Buddha multiplying himself into a thousand Buddhas—a standard subject done with less flair in other caves. Here, after the calm Buddhas were painted, neatly spaced over a wall, the artist unloosed between the figures rivers of flowing stems, flowers, buds and tendrils, creating swirls of energy and activity around centers of ultimate peace.

Or, in depicting the *jataka* story of Mahajanaka—which tells of a king who wished to leave his palace

Miss Jaffrey, a New Yorker born in India, is a freelance writer and actress who wrote about the remains of St. Francis Xavier in the May 1975 SMITHSONIAN.

A cloud-borne celestial couple, heavenly musicians keeping them company, soars toward entrance

and turn into an ascetic, and of his young wife who in desperation arranged all kinds of worldly delights to tempt him to stay—the artist had to paint a large cast of characters. The most riveting character, however, turned out to be not the king or the queen but the dancer, brought in to entertain and, it was hoped, to tempt. Against a background of glauconite green, she whirls away in a pillared pavilion, her ribbons flying.

Even though most of the painted scenes at Ajanta dealt with Buddha's life or with mythical themes, they reflected accurately the clothes, fashions and customs of the period in which they were painted. Hence the rich and beautiful were shown wearing the sheerest of fabrics (nicknamed "woven air" and "morning dew") and rarely covering themselves above the navel. (It was only the poor and lowly who went clothed!) Languid chocolate-colored damsels with large melon-shaped breasts, ugly dwarfs, pots, pitchers, geese, monkeys, elephants, bamboo umbrellas, stools, canopies, cups, flowers and fruit fill the surfaces of the walls with the same naturalness and ease as they (except for the damsels) would an Indian bazaar. Only the still, silent figure of Buddha or the *bodhisattvas*, appearing again and again, were painted in conventional poses, decided upon by preceding generations.

It is known that the caves occasionally were visited in the eighth century. Much less is known about the millennium that followed. Buddism fell into a decline in much of India. What was left of it was slowly absorbed into Hinduism, with Buddha treated as another reincarnation of Vishnu, the Preserver of the Hindu Triad, known for his mercy and goodness.

The thread of the story is picked up again in 1819 when the British, then ruling India through the East India Company, claimed their "discovery" of the caves. Cavalry officers of the Madras army, hunting tigers near Ajanta village, were led to the caves by a local youth. To mark the discovery, an officer scratched his name on the painted surface of a pillar. "John Smith 2c Cavalry 28 April 1819," he wrote. A little bit of paint was chipped off—perhaps right then—to obscure forever the number of his unit.

The British claimed discovery, but of course the cave area had been known to local residents all along. During the centuries when the caves were in their "undiscovered" state, many of God's creatures had been attracted to them, for a variety of reasons. Ascetics could hardly resist their lonely beauty. If the ascetics happened to be worshippers of Shiva, they just covered the Buddhist paintings with clay, daubed Shiva's symbol, the trident, over the clay and then proceeded with their meditation—or their cooking. With no cross-ventilation, the smoke and grease from their culinary efforts settled on large areas of the walls and ceilings.

Bats found the caves ideal habitats, too. They moved in, in great numbers, and clung tenaciously to the ceil-

of Cave 17, bringing their offerings of devotion to the Buddha enshrined deep within the cave.

ings—their excreta and urine dribbling, century after century, down the upper sections of the walls, causing paint and plaster to disintegrate and disappear. Bees found the verandas, porches and ledges most convenient for building hives. This drew the villagers to the caves: they smoked out the bees and sold the honey. More soot and dust accumulated.

Meanwhile, millions of busy and hungry little insects were boring through the paint to get at the vegetable fibers in the plaster. On their way, they generally demolished the binding glue in the paint as well. Through exposure to air, the glue was slowly losing its adhesive properties anyway. Everywhere paint and plaster were peeling. In 1824, when a Lieutenant James Alexander reached the caves with great difficulty, after climbing on his hands and knees, he found the footprints of tigers, jackals, bears, monkeys and peacocks. "These," he wrote later, "were imprinted upon the dust, formed by the plaster of the fresco

A playful dwarf, clinging to a lotus tendril, swings through the air, Tarzan-style, on Cave 1 ceiling.

Embodiments of the Buddha's grace and power, the *bodhisattvas*, or saints (left and right), guard the sacred shrine in the sanctuary of Cave 1. An attendant, at center, is also richly bejeweled.

painting which had fallen from the [cave's] ceiling."

Without any care or conservation for more than 1,000 years, the carved porches and verandas of many caves had fallen, pillars had crumbled and the steps connecting each cave to the river had turned to rubble. Debris was everywhere. When John Smith scratched his name, he scratched it so high up on a pillar it is to be assumed that he was standing on debris three to four feet in depth.

It is surprising that any paintings at all managed to survive those centuries of neglect. Miraculously, they did. The cavalry group in 1819 reported that "the paintings were in a decent state of preservation."

More devastation, though, was to follow. The early reports from British soldiers created a fair amount of excitement. Specialists were sent to decipher the inscriptions and to report in greater detail on the caves. As news of the "find" in the caves spread, more visitors appeared and the problem of vandalism became acute. Names were scratched all over the painted surfaces. In the hope of fetching high prices, heads—sometimes whole figures—were pried off the walls, only to crumble into dust shortly thereafter. One such fragment did survive. It was removed by a cadet, James Edwin Williams, in the early 19th century. On March 30, 1921, this fragment, about 13 by 15 inches, was auctioned at Sotheby's by Williams' descendants and purchased by the Boston Museum of Fine Arts—where it is today, the only piece of an Ajanta painting outside Ajanta.

In 1843, James Fergusson, one of the most respected authorities on Indian architecture, appealed to the British authorities to do all they could to preserve the caves and to have copies made of the paintings before they perished. Copies were made, but most of the first two lots were destroyed by fire.

But enough paintings remained to bring out two folios in 1896. These, together with yet another set of copies made by a Lady Herringham and published 19 years later, had a remarkable impact on the outside world. European painters, already influenced by African masks, Japanese prints and Polynesian colors, welcomed the new discovery. Some, like Ernest Ludwig Kirchner, the German expressionist, spent many months copying the languid, easy forms and groupings of the Ajanta women. In India, the Ajanta style was to affect generations of art students, printers, cloth-weavers, jewelers and, later on, even the costume designers of the Bombay film industry.

All this time no real conservation work had been done at Ajanta. Technically, Ajanta was in the dominion of the Nizam of Hyderabad. His men had the unfortunate habit of sometimes carrying buckets of varnish with them when an important visitor appeared to see the caves. A fresh splash brought out the colors of the paintings. The outlines got clearer and the images glowed—for a while. As the varnish dried—which it did slowly—dust clung to it, creating a thick, murky film. Sometimes linseed oil was used for the same purpose. This was just absorbed by the paintings.

By 1920, even the Nizam was convinced that more elaborate steps needed to be taken. Two Italian conservators were called in. They cleaned off some of the accumulated varnish with alcohol, turpentine and ammonia. But in Caves 16 and 17, where a great deal of

In Cave 17 the light and dark-skinned figures at left are palace attendants. Bearded man at center is a god disguised as a beggar. A saint (right) awaits rebirth as a future Buddha.

painting had survived and had been repeatedly varnished over, they found that either they were removing the colors as well as the varnish or else leaving a dingy smear. They did fix a great deal of the loose plaster with injections of casein and lime or with an edging of plaster of Paris. In order to try and preserve the paintings, they coated the walls with thin solutions of shellac or gum dammar. The Nizam saw to it that a few leaks were plugged up, screens erected to keep the bats away, pillars and walkways restored, and more guards stationed on the premises.

In 1953 the government of India took over the Nizam's dominions and total supervision of the caves. The wild jungles surrounding Ajanta gradually had been cleared to make room for cotton, sugarcane and mustard fields. Tigers and jackals were rarely seen. Access to the caves was easy and safe.

But the deterioration had gone on relentlessly. The insects, silverfish and tiny beetles were still there, feasting away on the plaster. A huge leak had developed in Cave 16. Some painted areas of the caves were so darkened with dirt, oil and varnish that they were considered irretrievable. Where cleaning of darkened varnish had been attempted, "blanching"—a kind of chalkiness—had resulted, leading to cries and complaints that the paintings, India's national treasures, were first ruined by those who had applied the varnish—like the Italians—and now were being ruined by the Indian government which was allowing the paintings to be cleaned away or, as in the case of the exposed verandas, to just fade away in the sunlight.

The Indian government, stung by this harsh and, as it turned out, undeserved criticism, closed the major caves, to carry on the cleaning slowly, carefully—and in privacy. The opinion of experts like Professor Lawrence J. Majewski, Chairman of the Conservation Center, New York University Institute of Fine Arts, was sought. By closing the caves, the Indian officials also hoped to measure the moisture and temperature changes under controlled conditions. If there was too much fluctuation, considered dangerous to the paintings, worried officials were willing even to think of some kind of air-conditioning system. A field laboratory was set up downstream from the caves where chemists could imbed tiny fragments from the walls in clear Hylac resin, examine the cross sections under a microscope and see if any pigment at all was buried under the dirt. If there was, they could analyze all the layers of dirt and decide which chemicals to use and in what strength.

The fear that the paintings were being cleaned away turned out to be quite unfounded. As Professor Majewski and S. K. Singh, the chemist at the site, explained, "blanching" often results when thick varnish is cleaned with chemicals that do not dissolve all the components of the resin. Further cleaning with other chemicals removes this chalkiness. The paintings underneath are all in good condition. It may just take time to get to them. As for the paintings fading away, both Mr. Singh and Professor Majewski say that earth colors, derived from rocks, do not fade. Professor Majewski, in a report to the Smithsonian Institution, even has a good word to say about the much-maligned Italian conservators. He feels that their varnish may

have distorted the colors (the true colors still can be seen on some of the unvarnished ceilings), but it did have a preserving effect on the paintings.

The work has proceeded slowly but fairly steadily at Ajanta. The big leak in Cave 16 has been plugged with 180 bags of cement. Loose plaster and paint is being gently reattached with a solution of polyvinyl acetate. Surviving sections of paintings are being secured to the rock with a fine edging of appropriately tinted plaster of Paris. The guards, together with notices threatening dire consequences to defacers, have eliminated vandalism.

Elimination of insects proved to be more difficult. Fumigation, as well as injection into the plaster of pyrethrin and Formalin, has been tried. But the eggs generally manage to survive these efforts.

As for chemical cleaning of the paintings, while it is being done scientifically—with great thoughtfulness and care—it would take the two lonely chemists at the site years to finish all the work. The process is laborious. First a small section, about a foot square, is cleaned gently with swabs of cotton wool. The area is left to dry and the results are watched. If the chemicals have done their work, a wash is given with Cellosolve and alcohol. Then, another wait for drying.

Finally comes the application of one or more thin coatings of a diluted polyvinyl acetate to preserve the cleaned surface. Despite the slow pace, miracles have been achieved. In one darkened section of Cave 17, a cleaned area glows brightly. A few prancing monkeys, after untold years, suddenly are visible. In Cave 6 it was thought there were no paintings at all. This cave, with its pitch-black walls, was used to store cement and the cement had settled all over the walls. Then, far back in the sanctuary, the chemists began cleaning. Now, a Buddha in bright orange robes has appeared.

The systematic measuring of the temperature and humidity in the caves has provided another pleasant surprise. The caves do not need any air-conditioning system after all because they are naturally air-conditioned. The temperature inside stays a steady 80-85 degrees F. And, in spite of the heavy monsoons, changes in humidity are gradual, the moisture level in the plaster never rising to dangerous levels. Professor Majewski feels that small groups—no more than 20 people—could be taken into the caves without causing damage and the last padlocks at Ajanta may soon be removed.

Part fish, part flower, part cow, imaginary creatures dance on ceiling of Cave 1 great hall.

An amorous pair bears a great lotus flower to Buddha in Cave 1, most lavishly decorated of all.

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THE NEW LAND THAT WAS TO BECOME AMERICA was a perilous wilderness, far off across the storm-tossed sea. But the tiny ships set out bravely. For the new land represented liberty and opportunity. Freedom from religious persecution and economic oppression. Hope for the future.

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Regal statue of Justin Morgan (left and above), first of the long line, stands at Weybridge, Vermont.

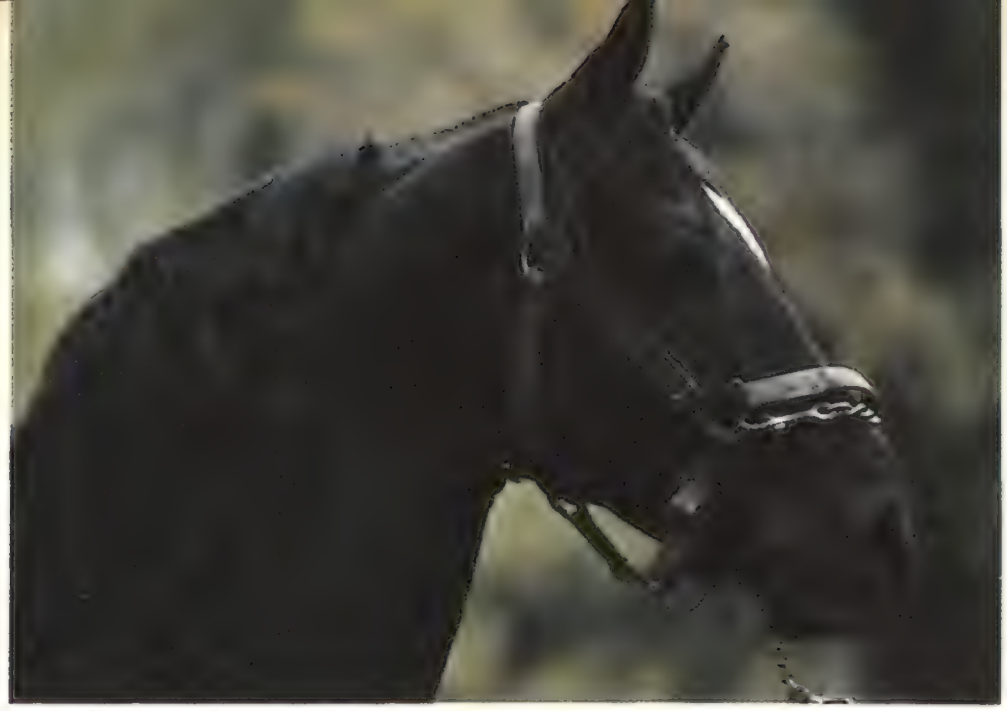
By Peter Chew

Morgan horses: brave, unchanging all-purpose breed

After nearly 200 years, the sturdy little strain that carried Sheridan and Jackson is more popular than ever among U.S. enthusiasts

On Christmas day 1861, the nearly 1,000 officers and men of the newly mustered First Vermont Cavalry Regiment galloped into the village of Marlboro, Maryland, on their little Morgan horses. They were bound from Washington for training quarters at Annapolis, and it is safe to say they failed to strike terror in the hearts of Confederate sympathizers along their path.

"Our appearance must have been picturesque," a cavalryman recalled in George G. Benedict's lively *Vermont in the Civil War.* "In addition to our equipments of sabre, pistol, haversack, canteen, lariat rope and pin, feed-bag and blankets, we had cups, plates, frying-pans, coffee-pots, shawls, mattresses, pillows,



Thick neck and widely set eyes characterize the Morgan of today, like those of his original ancestor.

valises, satchels, brushes, and other things too numerous to mention—all in some unaccountable way attached to our horses and ourselves, so that we had, when mounted, breastworks in our front, and bulwarks in our rear.

"With horses unused to marching, and riders unused to riding, and officers unused to everything in the service, we went most of the way at a pace little short of a charge."

The Vermonters learned fast under fire, however, making up in courage and dash what they lacked in experience and finesse. They saw action for the first time on April 16, 1862, at the head of a force attacking General Stonewall Jackson's rear guard occupying the town of Mount Jackson in the Shenandoah Valley of Virginia. In a stirring passage, historian Benedict describes what happened after the regiment received its first "Make ready for a charge!" order:

"The order was executed by a dash of a mile and a half along the turnpike, in close column of fours. As the regiment moved forward on the trot the cannonading grew brisker. The men pulled their caps tightly over their heads, saw that their sword knots were about their wrists and grabbed their sabres firmly. The bugle sounded the charge, horses shared the excitement of the troops as the gallop began, and with lifted sabres glistening in the morning sunlight, and the clatter of thousands of hoofs on the hard turnpike . . . and the Union cheers riding high over all, the long column dashed into the village, from which a party of Confederate cavalry beat a hasty retreat."

One mile past the town, the Vermonters galloped onto a burning bridge across the Shenandoah River. Under shellfire from the heights beyond, they put out the flames with water scooped from the river with their horses' nose bags, and secured their position—without suffering a serious casualty.

From that day forward the First Vermont Cavalry

Mane flying and eyes alight, a present-day Morgan stallion charges on University of Vermont farm.

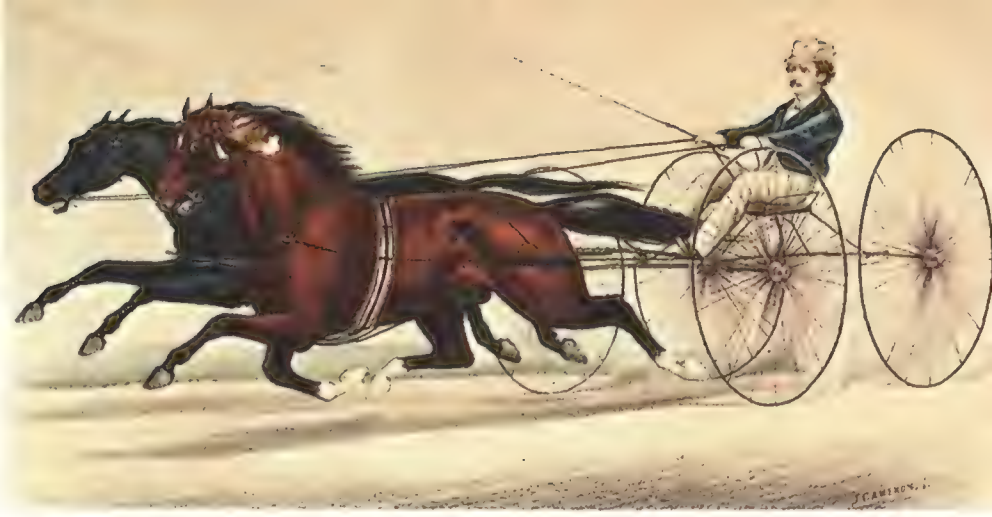
fought an average of two engagements a month, 75 in all by the end of the war, including Gettysburg, Cedar Creek, the Wilderness Campaign and Appomattox Court House. They received high praise from commanding generals such as Philip Sheridan, and their Morgan horses emerged from the conflict with a worldwide reputation for courage, intelligence and incredible stamina. At least one Confederate soldier captured by the Vermonters exclaimed: "It was your hawses that done licked us!"

Although the Morgan war horses averaged little over 14 hands 2 inches in height (a hand is four inches), they far outlasted other, larger breeds. Because of their hardiness and their stylish, head-high carriage, the Morgans were prized by men on both sides.

Stonewall Jackson's Little Sorrel was a Morgan that had been captured from a Yankee supply train. Though scarcely 14 hands, the close-coupled, stocky animal could go for days on end, and it was said that "he could eat a ton of hay or live on cobs."

Douglas Southall Freeman wrote that Little Sorrel's "skill in letting down draw-bars with his teeth was amazing. In the same way he could take the rails off a fence until it was low enough for him to jump. . . . He learned how to remove the peg from the stable door hasp and daily, unless watched, he would go to the stables, release all the other horses and then lead them one behind the other into pleasant pastures."

One of the most famous Civil War chargers was Sheridan's Rienzi, later renamed Winchester, a jet-black gelding standing 16 hands, unusually large for a Morgan. After the flamboyant General Sheridan's fabled ride from Winchester to Cedar Creek, Virginia, to rally his demoralized troops, the noble Rienzi



Currier & Ives print of Ethan Allen, celebrated bay trotting stallion, with running mate, in 1867.

was immortalized by poet Thomas Buchanan Read:

Be it said in letters both bold and bright,
"Here is the steed that saved the day
By carrying Sheridan into the fight,
From Winchester—twenty miles away!"

The horse stands today on exhibit in the Smithsonian's Hall of Armed Forces History in the Museum of History and Technology. Once Sheridan's tribute accompanied it: ". . . He was as cool and quiet under fire as one of my old soldiers. I doubt if his superior as a horse for field service was ever ridden by anyone."

Although the Morgan's fame reached new heights during the North-South struggle, his genesis antedates the war by some 70 years. Justin Morgan, the bay stallion founder of the breed, was foaled in either Massachusetts or Vermont in the late 1780s or early 1790s. The breed's reputation was well-established at home and abroad long before it went to war.

In Vermont the horses were used as beasts of burden to wrench stumps and rocks from the hillsides, and to draw buggies, coaches and wagons. They were riding

Left: Morgans proved tireless at farm work, as in this threshing scene. General Phil Sheridan, rallying troops, rides Morgan charger, Rienzi. Right: cowhand's Morgan shows its skill in cutting.

On the plains, a Morgan stops short so its rider can take aim in a pioneer-and-Indian fight.

horses, too, and their owners often engaged in informal trotting and running races with their best ones. In New York and Boston, Morgans jogged between the shafts of fine carriages owned by the wealthy.

During the mid-19th century, Morgan trotting horses such as Ethan Allen 50—said to be a great-great-grandson of Justin Morgan—were the fastest in the land. In his poem, "Vermont Memory Tracks," Leonard Twynham evoked the days at the little local tracks:

> *Tall weeds stretch vainly in the candid sun*
> *To hide the hard old cinder tracks from sight,*
> *Dim circular and oval paths reveal*
> *A tale of horses proud with Morgan strain. . . .*

One of the oldest American registered breeds, the Morgan has been so intimately associated with the nation's history that it would have made a fitting Bicentennial horse. The sturdy animals went west with the Gold Rushers and, tradition has it, to Utah with Brigham Young. Artist Frederic Remington, who encountered the breed on the Western ranges, considered them the best all-around horses this country ever developed. Comanche, said to be the only cavalry horse to survive the Little Big Horn engagement, was —that's right—a Morgan.

Today there are some 30,000 registered Morgans in this country, according to Al Drowne, executive secretary of the American Morgan Horse Association, and their numbers have been growing steadily for nearly a decade. No longer called upon to tow heavy "stoneboats," except in exhibitions, they are primarily used as light pleasure horses for riding, driving and competing in shows. Today's Morgan, says Drowne, is ideally between 14 hands 2 inches and 15 hands 2 inches.

At the all-Morgan show held annually at Northampton, Massachusetts, as many as 1,000 horses have competed. They are becoming big business, too. You can pay anywhere from a few hundred dollars, for an unregistered or "part-blood Morgan," to $40,000 for a proven show stallion. One went for $100,000.

Morgans are also popular for trail riding, as cutting horses on ranches, as police and park ranger horses, and as polo ponies. Indeed, to hear Morgan fanciers tell it, there is very little that the descendants of Justin Morgan can't do. The enthusiasm of Morgan people—breeders such as Virginia's John C. Hagan and Tennessee's R. A. Epperson—borders on the messianic.

When Epperson recently persuaded the Greater Knoxville Charity Horse Show for saddlebreds to become the first in the state to include Morgan classes, Hagan supported him by shipping five of his best Rapidan River Farm horses to compete, accompanied by

Peter Chew wrote about the resurgence of coaching in the March 1975 SMITHSONIAN. *His* Inner World of the Middle-Aged Man *will be published this fall.*

Matched black Morgans pull a carriage at Stratford Hall, Virginia. U.V.M. Promise (center), often a park harness champion, draws a fine buggy. Right: a Morgan pulls a jog cart.

Behind fence rails at the University of Vermont farm, two Morgans gently nuzzle each other.

his wife Marjorie and trainers Bob and Judy Whitney.

To this day, the origin of the Morgan breed remains wreathed in myth, mystery and controversy. One authority, Dr. Donald J. Balch, who has directed the breeding program at the University of Vermont's Morgan Horse Farm in Weybridge for 25 years, says that no one can be certain about the parentage of Justin Morgan, progenitor of the breed. Like many experts, Balch is inclined to believe that Justin Morgan had Arab blood, but beyond that he does not speculate.

What *is* certain is that the horse—known as Figure during his storied lifetime of about 30 years—was owned in his early years by a poor, consumptive singing master by the name of Justin Morgan, for whom the horse was eventually named. Morgan lived in Randolph, Vermont, and supplemented his income from time to time by leasing Figure to local farmers and loggers. Figure proved to be a horse of exceptional ability with great strength, speed and agility. As a stallion, he proved extraordinarily prepotent: *i.e.*, he possessed to a remarkable degree a capacity for stamping his characteristics upon his offspring.

In his *Morgan Horses,* published in 1857, D. C. Linsley provided a description of Justin Morgan which holds true in many basic respects for today's Morgan descendants:

"The original, or Justin Morgan, was about fourteen hands high, and weighed about nine hundred and fifty pounds. His color was dark-bay with black legs, mane and tail. He had no white hairs on him. His mane and tail were coarse and heavy. . . . His head was good, not extremely small, but lean and bony, the face straight, forehead broad, ears small and very fine, but set rather wide apart. His eyes were medium size, very dark and prominent, with a spirited but pleasant expression, and showed no white round the edge of the lid. His nostrils were very large, the muzzle small, and the lips close and firm. . . . His back and legs were perhaps his most noticeable points. The former was very short; the shoulder-blades and hip bones being very long and oblique, and the loins exceedingly broad and muscular. His body was rather long, round and deep, close ribbed up; chest deep and wide, with the breastbone projecting a good deal in front. His legs were short, close jointed, thin, but very wide, hard and free from meat, with muscles that were remarkably large for a horse of his size, and this superabundance of muscle exhibited itself at every step. . . ."

During a period when the horse was leased to a farmer named Robert Evans, the animal achieved a measure of local fame in a weight-pulling exhibition. An eyewitness, Nathan Nye, described the event:

"At the time Evans had this horse, a small tavern, a gristmill, and saw-mill were in operation on the branch of White River, in Randolph, and at this place the strength of men and horses in that settlement, were generally tested. On one occasion . . . I went to these mills, where I spent most of a day, and . . . many trials

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were had, for a small wager, to draw a certain pine log, which lay some ten rods from the saw-mill.

"Some horses were hitched to it that would weigh twelve hundred pounds, but not one of them could move its length. About dusk, Evans came down from his logging field, which was near by, and I told him the particulars of the drawing match. Evans requested me to show him the log, which I did; he then ran back to the tavern and challenged the company to bet a gallon of rum, that he could not draw the log fairly on to the logway, at three pulls with his colt. The challenge was promptly accepted. . . ."

When Evans arrived with his horse, he said he was ashamed to hitch his animal to such a small log. He asked three of the men to ride on the log and promised to forfeit his money if the horse failed the assignment.

"I was present with a lantern, and cautioned those on the log to look out for their legs, as I had seen the horse draw before, and knew something had got to come. At the word of command the horse started, log and men, and went more than half the distance before stopping. At the next pull, he landed his load at the spot agreed upon, to the astonishment of all. . . ."

Justin Morgan won many a quarter-mile dash. He was, by Linsley's description, a superhorse.

Alas, after the singing teacher's death in 1798, the horse passed from hand to hand and suffered nearly as many vicissitudes as Black Beauty. In the winter of 1821, the old warrior was kicked while running loose in an open yard; ". . . exposed without shelter to the inclemency of a northern winter, inflammation set in and he died," wrote Linsley. Today the horse lies buried in the pasture of a farm near Tunbridge, Vermont.

There is more to the Morgan saga. Around the turn of the century, with the gasoline buggy coming over the horizon, the Morgan breed was in danger of dying out. It was rescued by an eccentric Vermont millionaire, one Colonel Joseph Battell of Middlebury.

Battell hated the automobile with the same intensity he loved the Morgan horse. Among his properties was the *Middlebury Register,* whose columns he filled with gruesome accounts of automobile wrecks as far away as California.

They say, too, that Battell used to stand on the porch of a Middlebury inn and curse drivers of "death wagons," as he called them, who defiled the village green with noxious fumes. Far ahead of his time, he foresaw the ravages that highways would bring to the countryside; as an early conservationist, he bought up many thousands of acres of forest land and gave them to Middlebury College to save them from the loggers. But

In a pasture at the Weybridge farm, a Morgan foal prances over the grass, in its mother's hoofsteps.

it is for his contributions to the Morgan breed that he is principally remembered.

Battell compiled and published in 1894 the first volume of a massive register of Morgan horses, a labor of nearly ten years. On his farm at Weybridge he embarked upon a vigorous Morgan breeding program, turning over his stock and farm to the U.S. government in 1906 to carry on. Until 1951, when the government transferred the operation to the University of Vermont, these fine Morgans kept the breed alive. Farm director Balch estimates that 75 to 80 percent of today's registered Morgans trace back to the "Government Morgans," as they are known.

In recent years the breed has faced another crisis. Because of budgetary squeezes, Vermont has had to cut back on its support of the farm. To exist, Balch has had to concentrate upon sales of his young stock, and on fund-raising campaigns from horse lovers.

But even if the farm should close down, which breeders agree would be unfortunate, Morgans are being bred in ample numbers by private individuals to guarantee their future.

They say in Middlebury that the first and last gas buggy that Joseph Battell ever rode in was the motor-driven ambulance that carried him when he was stricken by a fatal illness in 1915. In his *The Morgan Horse and Register*, this spirited lover of the Morgan quotes a tribute by an old-time horseman, W. H. H. Murray: "The Morgans are the very embodiment of every quality and characteristic which is called for in a roadster. In them the poetry of equine nature and motion is expressed and set to music. In action they make a heroic appearance, and their hoofs beat melody from the path. In them is dash and shine and rhythm. They strike the road with the same nervous stroke with which the pigeon in full career strikes the air, and, like that tense-winged courier of the day, they laugh at hills, and mount them with a dash of spirited flight."

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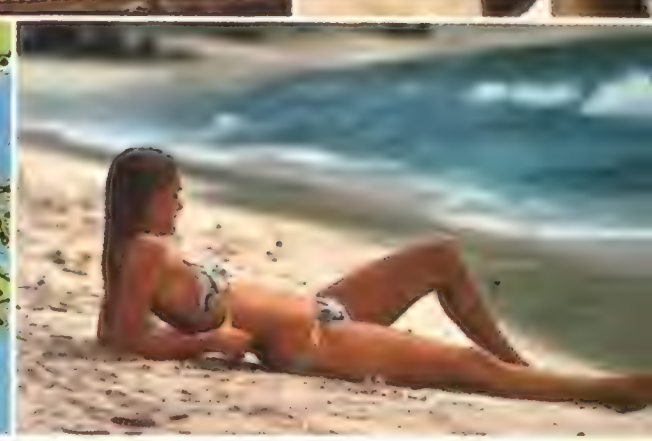

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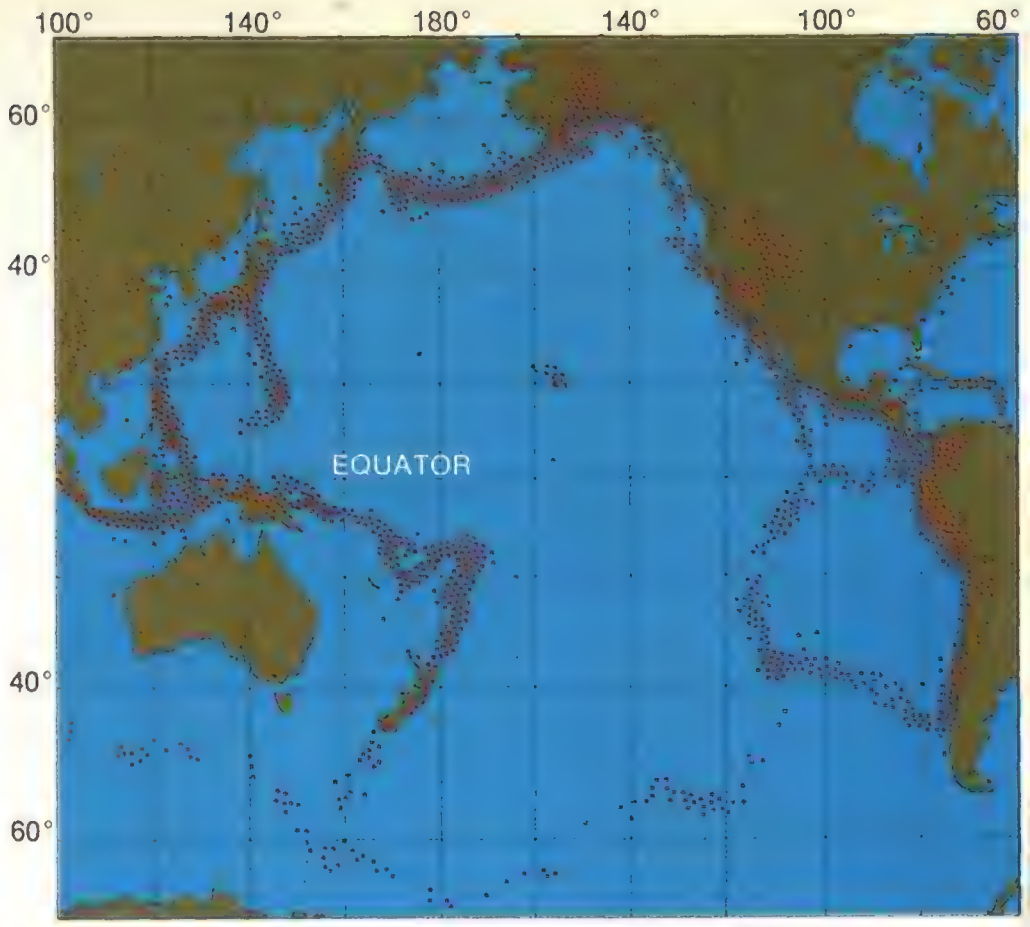
By Athelstan Spilhaus

New look in maps brings out patterns of plate tectonics

All cartography distorts, but Geo-Art makes this an asset, choosing proper projections to show order we had not appreciated before



In the map above, the red dots are sites of earthquake and volcano activity, the "ring of fire" around the Pacific. But the familiar Mercator projection may be misleading. At right the same points are plotted on an azimuthal equidistant map centered on Africa. Now it becomes apparent that they really mark the leading edges of the continents as they drift away from their starting point. The "ring of fire" is not around the Pacific at all, but around the wandering landmasses.

All attempts to interpret nature creatively have more in common than we ordinarily perceive. A world map is a mathematical picture that conveys some essence to the eye. A picture by a great artist is also an abstraction of the essence of what he sees. Both the artists who paint pictures and those we call cartographers (map makers) distill the three dimensions of the solid world to two on a flat plane. Each time we skin the orange that represents our globe and try to flatten out the skin to make a map, we must of necessity distort. But distortion need not be a detriment. In the mathematical or perspective abstractions that are maps, we choose our distortions to emphasize what we want to see—as an artist may distort for emphasis.

We cannot preserve distances, areas and shapes at one and the same time, because the orange peel distends as we flatten it out. We therefore choose to preserve some property that we wish to strike the eye and make the map truly a picture. In doing so, we may discover truths about the world that were not apparent on more familiar maps but show up clearly on maps suited to the purpose.

Geophysicists who study world seismicity and volcanism find that the most active areas form "a ring of fire" around the Pacific. But this ring has usually been represented on a Mercator projection or other rectangular maps (as above).

The Earth is round. When we spread the orange peel, the most unlikely spreading is rectangular. If we wish to depict a circular ring, let us choose a projection where circles on the real globe are depicted as circles on the flat picture. The Mercator projection (which is so commonly misused) and other rectangular maps of the globe do not do this.

Let us show the "ring of fire" around the Pacific on an azimuthal equidistant projection, a round map. We immediately see that the ring is actually around the great land continents (right). The ring is caused by the spreading of these continents; the tremors that we call earthquakes and the internal fiery belchings that are volcanoes are the results.

The plates carrying the landmasses are moving outward on a circular front. But you cannot see this unless you use the right map. And you would not see it if the center of the map were not carefully selected (in this case the center of the ring).

This map is conventional in that the North Pole is up but unconventional in that it is not at the top. Where we put the poles is arbitrary and sometimes chosen to reveal specific aspects of the globe best.

I was born in Capetown, South Africa, and as a small boy I resented the conventionality of my world atlases that always had the North Pole at the top. So much did this Southern Hemisphere boy object to this

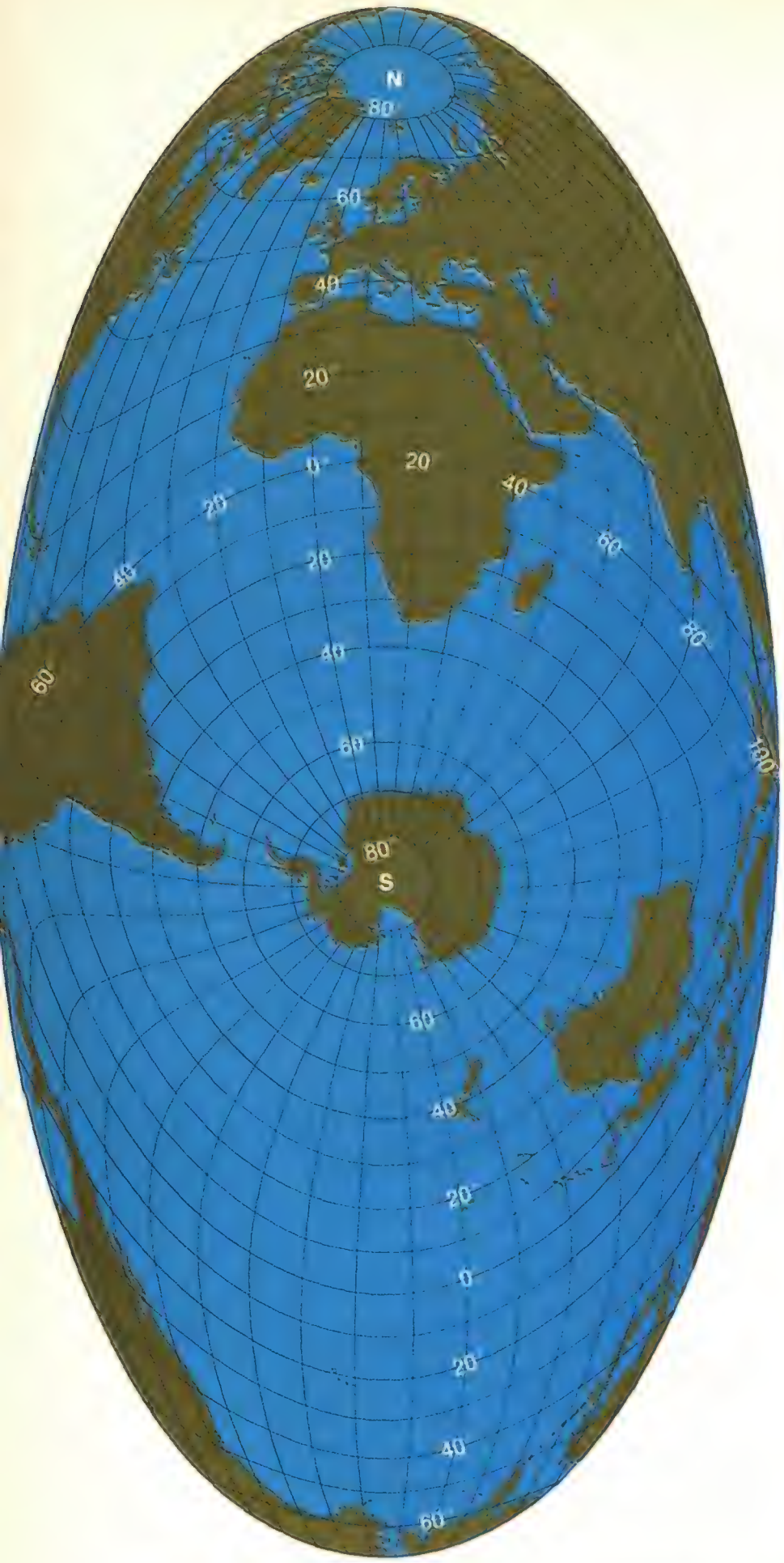
that he would either pin the maps upside down or stand on his head to look at them. (I also was aware that if the sundial had been invented in the Southern Hemisphere, clocks would run counterclockwise.)

This early revolt against conventionality in maps stayed with me and later became what I call "Geo-Art." As a university student and teacher interested in the oceans, I was irritated that landlubbers almost always put the edges of their maps so they cut through the middle of *my* oceans.

The Earth's surface is continuous, but to make a flat picture of it we have to cut the "skin" somewhere before we stretch or flatten it. Often the cut is made halfway around the world from pole to pole. Sometimes there are several cuts, sometimes just a pinprick which stretches infinitely to form the edge. These cuts which form the edges of the map are called "interruptions."

In 1941 I decided to counter the usual interruption of the grand world ocean by designing a map for ocean people and choosing to put the slit in the orange peel

Maps conceived by Dr. Spilhaus, rendered by Francis & Shaw



The author conceived this map 34 years ago to make a point long understood by oceanographers: that all the world's oceans are really one, interrupted here and there by landmasses. There is no perfect way to skin the globe and lay it out flat. What you see depends in part on where you decide to cut the skin. This projection cuts the skin entirely within land; thus the edges of the map nowhere interrupt the ocean. The author has prepared a similar map, not shown here, in which the proximity of the landmasses is emphasized. The point is that no flat map can show the whole globe without distortion; the trick is to choose the projection that will show you what you want to see.

entirely through land. This map showed for the first time the oceans as a whole (left). As in Genesis 1:9, "Let the waters under the heaven be gathered together unto one place. . . ." Once you have the right map, it is clear that the oceans are one. The map showed three petal-like seas—the Atlantic, Indian and Pacific—blossoming out from the Southern ocean that surrounds Antarctica.

All of this is merely the choice of the interruption—where we make the incision through the skin of the orange before we peel and flatten. People today think of maps on a flat sheet as being the result of some eyeball perspective view. But this is not always true.

All of my maps mentioned so far are mathematical projections with extremely useful special properties. They were drawn with computers, and cannot be produced by moving the eye inside a globe, say, or shining a light through it. But true perspective projections are also useful. Perspective (from the Latin "to see through") comes from mathematics, too; it is the art of representing solid objects by a flat drawing which affects the eye the same as the object does. Each ray from the eye strikes a visible part of the object and is continued in a straight line onto a flat plane behind. When the object is a globe of the Earth, we get a perspective projection map. The projections we obtain on the flat sheet depend on where our eye is in relation to the globe.

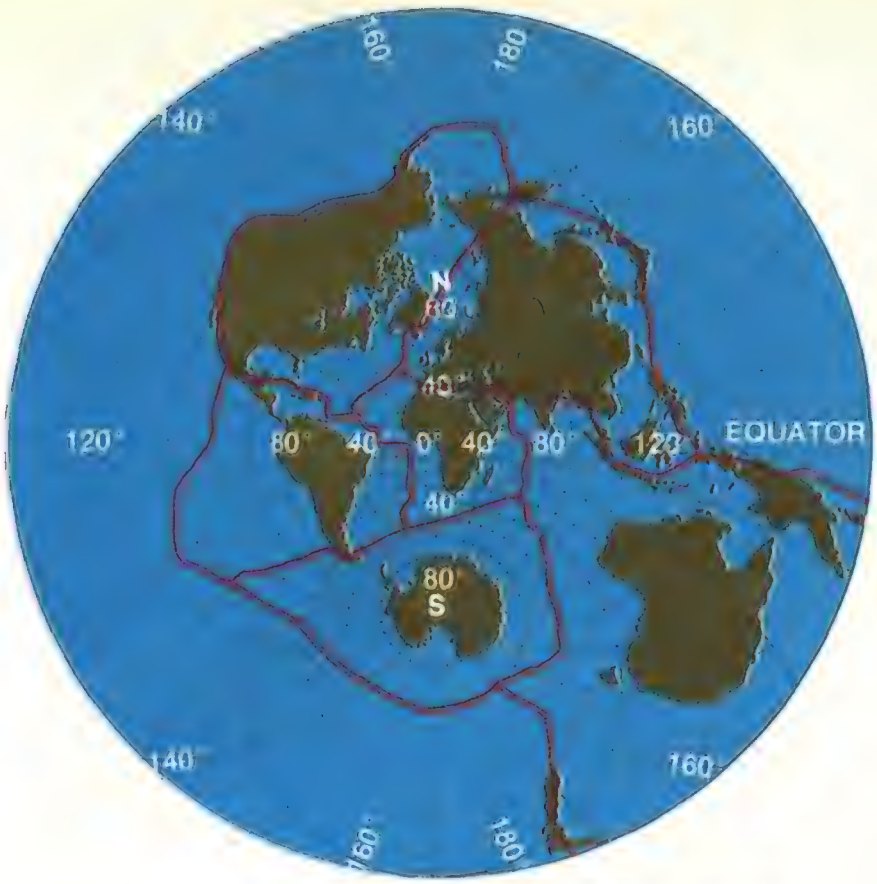
The orthographic projection is a picture of the Earth as it would appear if the eye's view extended to infinity. This has been approximately experienced by the men who flew to the moon.

When we imagine placing a light at the antipode of the chosen center, and projecting through the globe onto a flat sheet tangent to the center, we obtain a stereographic projection (p. 57). (Here stereographic does not refer to three-dimensional pictures but to the root meaning of the word: drawing of a solid. The first stereographic map was drawn in 1704.)

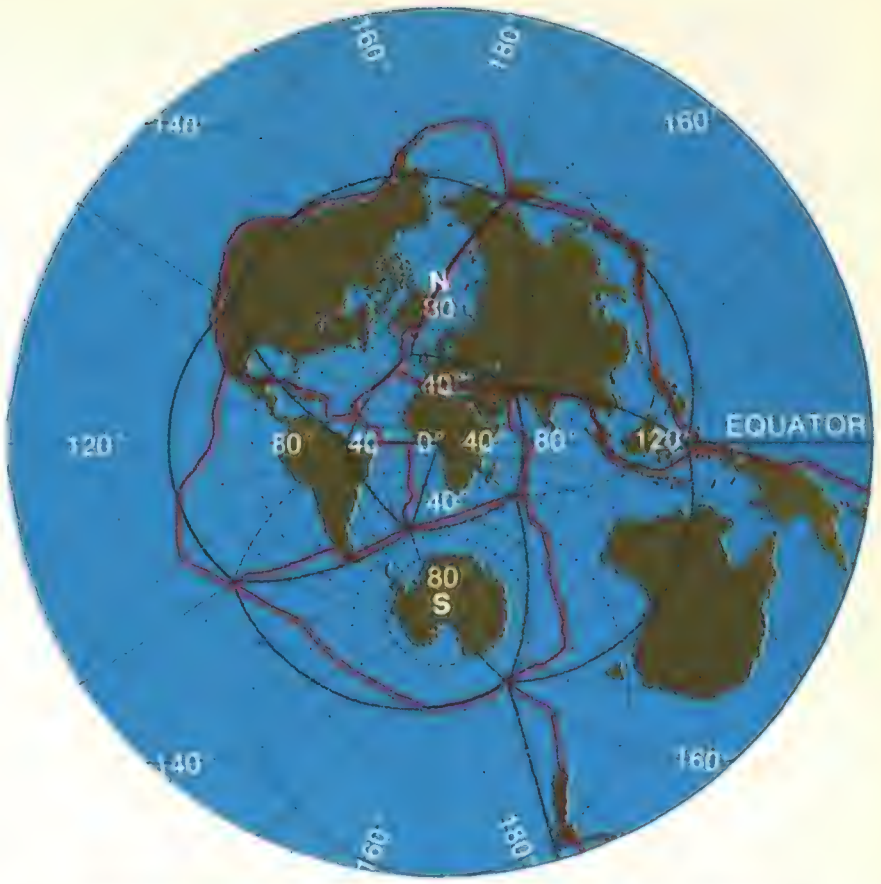
This projection has the useful property that small shapes on the globe have the same shape on the flat map and latitude and longitude lines cut at right angles so that compass directions at any point are true. Great circles (which are any circumference of the Earth; the equator is just one) are circles on the projection. In fact, any circles will appear as circles in this projection.

The gnomonic (from the Greek for "interpreter") projection is a perspective map where the light is at the center of the Earth (p.62). In the gnomonic, circles appear as straight lines. This property shows the

The interests of Dr. Spilhaus (SMITHSONIAN, *December 1971), now a NOAA consultant, range from geophysics to art to anything in between.*



When the author plotted crustal plate boundaries as on the map above, left, "the pattern stared out: a central pentagonlike plate surrounded by five regular rhombs (equilateral parallelograms)."



In the same map at right, an icosahedron (a spherical solid composed of 20 equilateral triangles) is seen projected onto the map; there seems a clear correlation between it and the pattern formed by the plates.

shortest route between two points. (Shortest routes are *not* shown on a Mercator.)

The proper use of projections for the purpose in mind can give astonishing insight. Let us return now to continental drift and plate tectonics to illustrate this. The theory began with people who looked at maps and drew conclusions about the continents.

In 1933, when I was a student in meteorology, I ran into a book Alfred Wegener had published in 1915 entitled *Die Enstehung der Kontinente und Ozeane (The Origin of Continents and Oceans).* Wegener was a meteorologist, although it was the beautiful simplicity of his ideas that wedded me to the concept of continental drift (SMITHSONIAN, January, February, 1975).

I believed in the splitting of Pangaea during all the time that great geologists pooh-poohed Wegener's grand scheme. I believed in it because it was too beautiful to be wrong. Continental drift appealed to Wegener and his predecessors because the simple jigsaw pattern of continents fitting together gave an eyeball view—an artist's view—of their origin. Here art preceded science.

Although continental drift is now widely accepted, there are still those who doubt it. One is A. J. Mantura, who criticizes the idea of continental drift because of the "curious shapes" of the crustal plates. Mantura has been looking at the plates depicted on a Mercator projection. Most geophysicists, brilliant in their contributions to fundamental geodynamic understanding, have plotted their global findings on the familiar but so often misused Mercator projection.

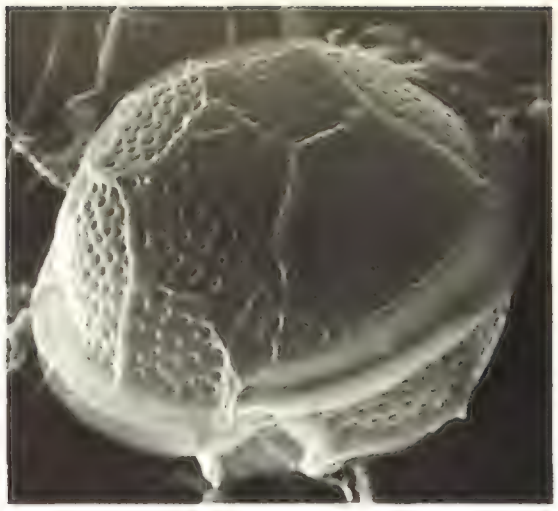
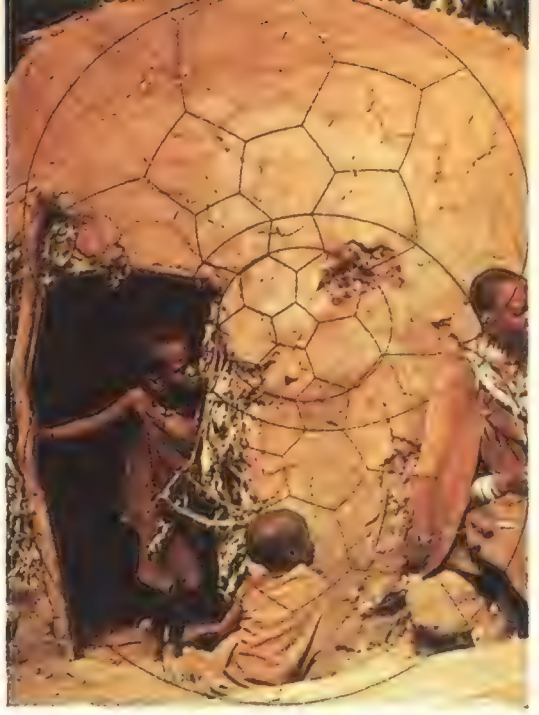
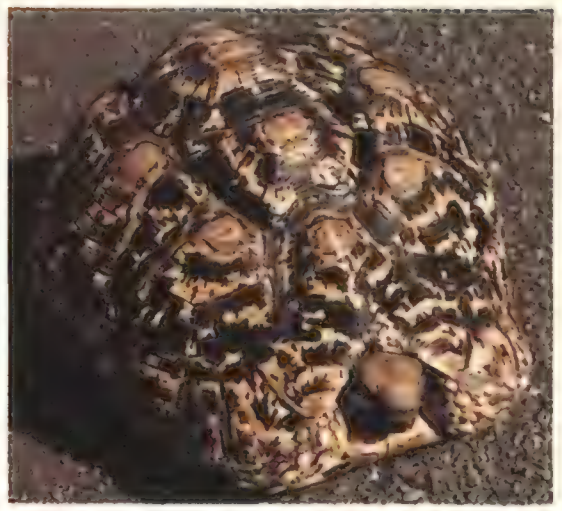
The Mercator, marvelous invention of a 16th-century Flemish cartographer, was designed for one purpose—and one purpose alone—the navigation of the seas. On it a rhumb line—the course that one would travel on a ship if one set and held to a constant compass heading—is a straight line. Latitude and longitude lines cross at right angles, so a simple protractor can be used to enter a ship's course. These special properties have made it indispensable to every navigator everywhere.

The Mercator is not a true world map as it cannot depict the whole Earth—usually the North and South Polar regions are omitted. This map of the world which is used in millions of schoolrooms starts children out with a false sense of world geography. But to quote Charles H. Deetz and Oscar S. Adams:

Let none dare to attribute the shame,
Of misuse of projections to Mercator's name;
But smother quite, and let infamy light
Upon those who do misuse,
Publish or recite.

To show the plate shapes on the globe we must choose a map that preserves shapes—but which also depicts circles as circles and includes the important poles. I chose a stereographic projection. When I took the same data of the spreading of the rift valleys of the oceans and the plate boundaries and plotted it on this map, the pattern stared out at me (above). These shapes were not "curious" at all but in remarkably

Here three of the five platonic solids are seen inside a transparent Earth. Not only do the solids provide a framework for patterns that appear in surface plates, but their own common vertices mark the locations of greatest tectonic activity on the Earth's surface. To make it easier to see the solids, they are reproduced below the globe in the same colors: tetrahedron, cube and dodecahedron.

The patterns we find in the Earth's crustal plates show up elsewhere in nature. Here, left to right, are a marine dinoflagellate, mud drying on the curved surface of an African hut, and plates on a tortoise.

regular relationship. They suggested to me the projection of one of the regular solids that have intrigued artists, physicists and mathematicians for more than 2,500 years.

The regular solids are those formed by a number of similar equal shapes. A cube, for example, is formed by six squares. Three of these solids were known to the Egyptians. Pythagoras probably discovered the other two about 500 B.C. None has been added since.

They're called platonic solids because, not much later, Plato related four of them to the four elements on Earth—land, fire, air, water—and the fifth to the universe. Kepler, almost 1,900 years later, ascribed significance to them for the spacing of the then known planets to emphasize his belief and joy in the harmony of the universe: "the Music of the Spheres," as his contemporary, Shakespeare, put it.

The map on p. 57 shows the boundaries of the major plates and the principal triple points where three boundaries meet. Superimposed is the projection of one of the five platonic solids—the icosahedron, a solid made up of 20 equilateral triangles of the same size. The vertices of this icosahedron—where several edges meet—all touch the inside of the sphere and the edges are projected onto the map. The faces of this platonic solid agree closely with the plates found by geophysicists. The orogenic foci (where lines of earthquake and volcanic activity meet) and the vertices of the icosahedron coincide to a remarkable degree.

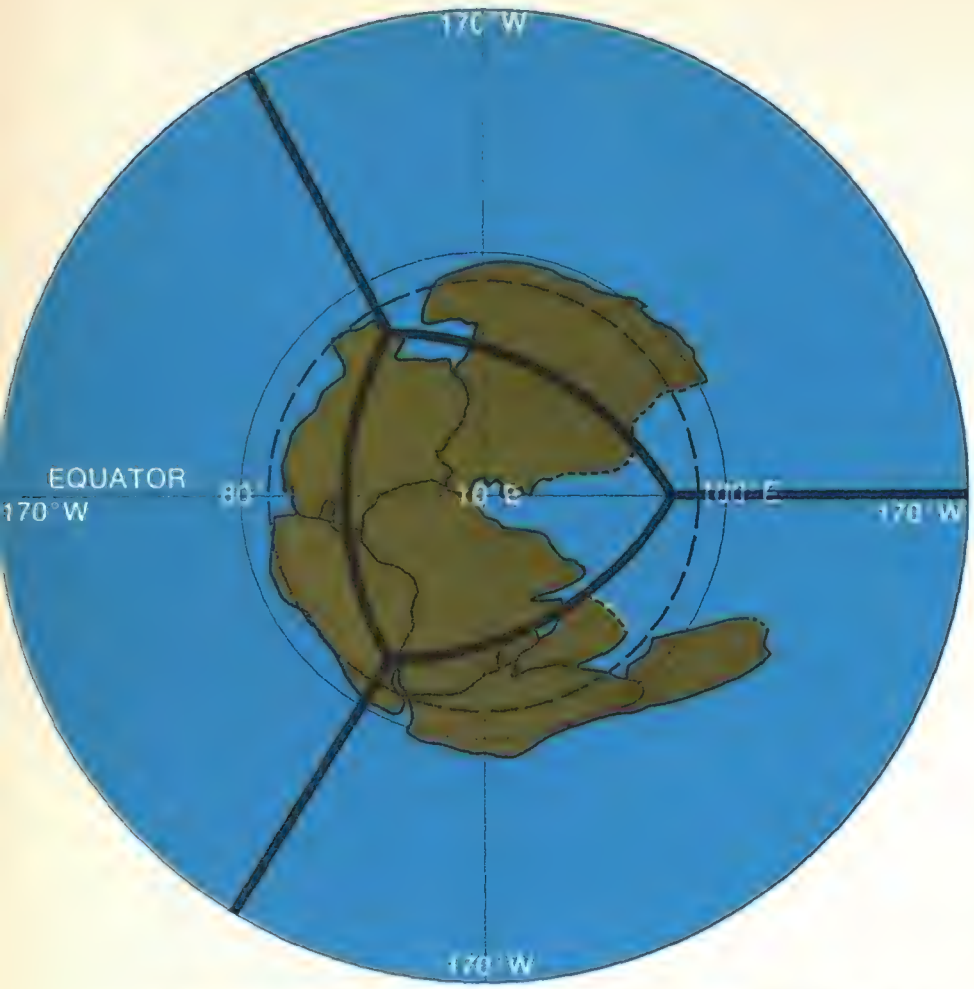
Let us now choose the appropriate map projections to depict and understand continental drift. On an equal area map we can draw the boundaries of the continents. But what are the boundaries? They are usually arbitrarily defined by isobaths, lines drawn on maps joining points on the seabed which are the same distance below the sea surface. Various writers have used as the boundaries various isobaths: 200 meters, 1,000 meters and 2,000 meters below sea level.

But what is our hangup with sea level? It is a transitory thing, useful as a reference in our times, but of very doubtful usefulness when we are thinking of Earth events stretching back hundreds of millions of years to when the oceans were still filling and sea level therefore changing.

In my look at global history I throw away sea level, and find a more fundamental definition for continental boundaries. Continents are bits of earth material that stick out. Oceans are depressions in the earth material that reach down. If we think of Pangaea (the original, single, supercontinent) as being extruded from the interior of the Earth and originally circular like a cardinal's cap on the face of the globe, can we estimate how far this beanie stretches down? Suppose we take a cosmic bulldozer and level the Earth once more, pushing the mountains into the depths of the sea so that we may end up with a true, smooth geoid. The land now emergent above present sea level is less than enough to fill the abysses and depths of the sea. Our bulldozer would have to scrape off much more. We find that the mean sphere depth, once the leveling is completed, would be 2,440 meters below present sea level. This then seems to be a reasonable "eternal" criterion for a definition of continental boundaries.

On an equal area map we can draw the 2,440-meter isobath around the present continents, then count squares to find out what proportion of the Earth's surface stands above this isobath. The figure comes out a little more than 40 percent. If Pangaea was originally uniform, it would then form a cap about 3,000 meters thick that would extend 80 degrees in every direction from its center.

We can use reverse dead reckoning to check this. Dead reckoning is a navigational system in which the position of a ship or plane is determined by calculating how long it has been traveling at what speed in what direction from its last known position. In reverse



Reversing the present drift of the continents takes us into the past when there was but a single landmass, now called Pangaea. The circle in dashes represents 80 degrees from its center, occupied by the land. The solid circle is a part of the grid. The projection of a tetrahedron, in black, is significant because its three points fall on the splits that tore Pangaea apart.

dead reckoning, then, you run the film backward to find out where you were from where you are now.

Applying reverse dead reckoning to the drift of continents, we see them move toward Africa, and once back in one piece, all the land is indeed bounded by a circle extending 80 degrees from the center.

Triple points (three cracks or junctions spaced more or less evenly apart) are found all over by geophysicists. The major triple points—the cracks in Pangaea—we have shown. Triple points are typical of what happens when a homogeneous material is uniformly stressed to its breaking point.

Let us turn from our maps to the platonic solids and speculate on whether they could have formed the sculptor's wire framework for whatever mechanisms within the Earth led to the regularity of continental distribution. Although we no longer seek harmony in nature in static forms as Kepler did for the planets, such regular patterns often result from the harmony of dynamical laws.

Edges join in triple points in three of the platonic solids: the tetrahedron, the cube and the dodecahedron. Triple points are also found in some of the 13 Archimedean regular polyhedra, such as the x-sided icosidodecahedron. The same patterns that we find in the cracks in Pangaea are found over and over again elsewhere in nature. Crystals of salt are cubes; alum crystals are octahedra and many others (such as some pyrites which are almost regular icosahedra) are combinations of classical solid shapes.

A dinoflagellate (one of the constituents of plankton) just 13 microns across has a perfect dodecahedral structure (p. 59). It is marvelous to think that the basic pattern of platonic solids is common to this tiny organism and to the great globe on which it originated.

The same patterns with triple points are shown in the cracks caused by the sun's drying of the mud covering an African hut, and on tortoise shells. As the tortoise grows, material between the individual plates of its shell causes them to grow without changing the pattern, just as the material oozing from the interior of the Earth from the rifts in the new oceans causes the great global tectonic plates to grow without changing their patterns.

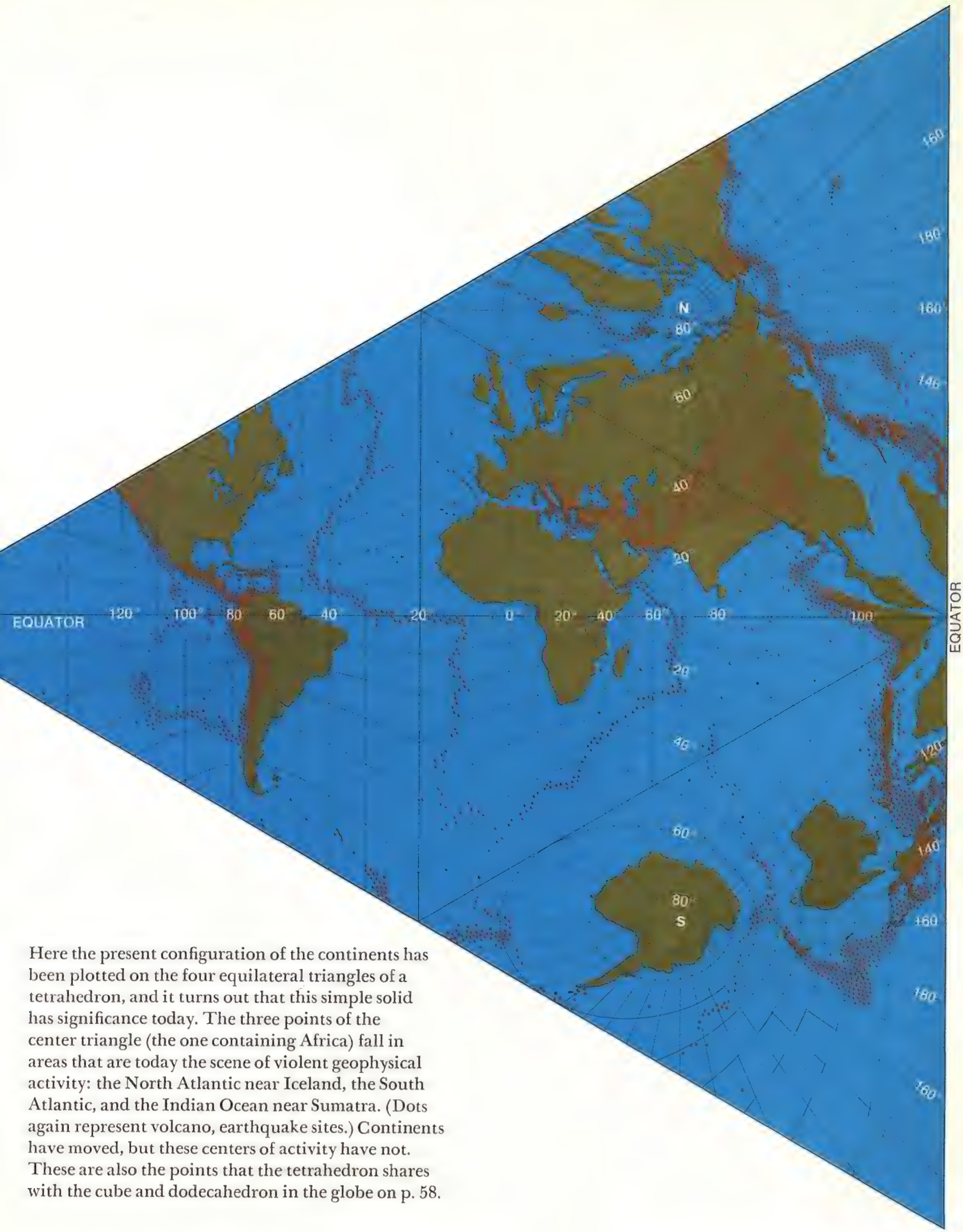
There are still great questions as to what caused the splitting of Pangaea. Was it drift caused by circulations within the mantle, as accepted by many geophysicists today? Was it contraction or expansion of the whole Earth, which would either wrinkle or split the skin? Was it seismic occurrences or a dynamic mechanism associated with the wandering of the axis relative to the off-center land cap of Pangaea?

I am not wise enough nor do I care to make invidious choices between the determined drifters, the tectonic technicians, the spherical shrinkers, the Earth expanders, the seismic shakers or the peripatetic polarists. But whatever mechanism is responsible, it seems to me that the basic framework for the mechanism must be somewhat related to the fundamental figures that intrigued Plato so much.

Triple points mark hot spots

Let us see. Three of the five platonic solids—the tetrahedron, the cube and the dodecahedron—fit together. We can fit a cube into the dodecahedron (with its 20 vertices), and find that the cube's eight vertices coincide with eight of those of the dodecahedron. The tetrahedron fits perfectly into the cube. Its four vertices are common to four of the eight of the cube.

So we see that four vertices are common to all three of the platonic figures with triple points. Can these common triple points have any special significance and permanence as centers of internal surface interaction on Earth? In the map above, the projection of a tetrahedron is superimposed on our reconstruction of Pangaea by reverse dead reckoning. Note that the eastern triple point is central to the split that geophysicists call the Tethys Sea. The northern point falls in Sinus Borealis, and the southern point falls at the



Here the present configuration of the continents has been plotted on the four equilateral triangles of a tetrahedron, and it turns out that this simple solid has significance today. The three points of the center triangle (the one containing Africa) fall in areas that are today the scene of violent geophysical activity: the North Atlantic near Iceland, the South Atlantic, and the Indian Ocean near Sumatra. (Dots again represent volcano, earthquake sites.) Continents have moved, but these centers of activity have not. These are also the points that the tetrahedron shares with the cube and dodecahedron in the globe on p. 58.

Walvis "hot spot" as reconstructed by Robert S. Dietz and John C. Holden for 200 million years ago.

This simple tetrahedral framework with these three points common to the platonic solids do indeed fall in places of special significance. Even today, if we superimpose the tetrahedron on our present map of the continent positions, we find the points fall on three continuing main orogenic centers. These principal centers of activity have not moved relative to the poles although the continents have.

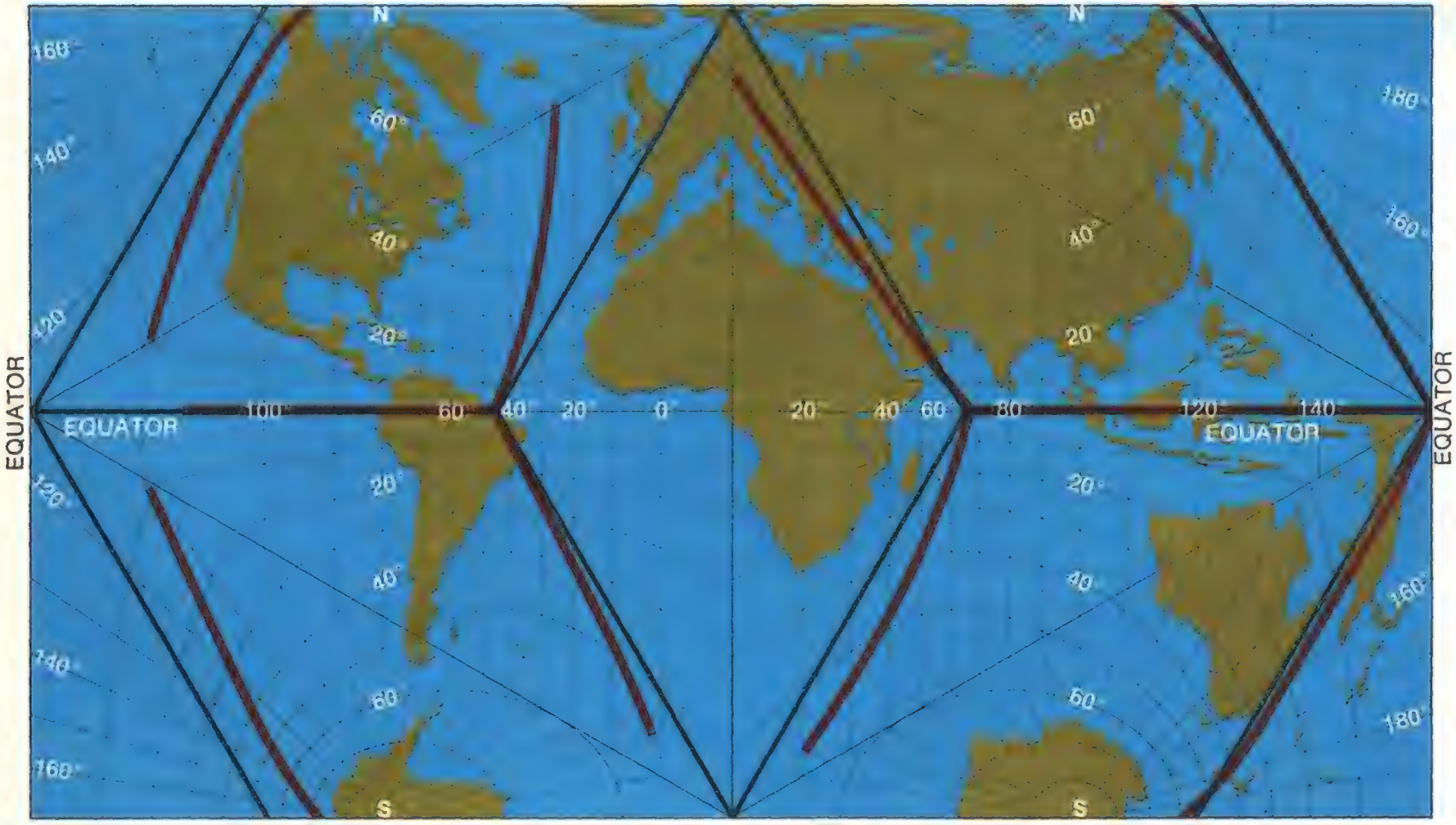
The tetrahedron is the simplest platonic solid. It has the smallest number of faces (four). It also has the smallest number of interruptions (three) to spread it out flat. I have drawn by computer the projection of the sphere onto four triangular tetrahedral faces, placing the apexes of the tetrahedron in conformity with the map on p. 60. The resulting map, complete with the ring of fire that started our quest, is on p. 61.

To look at one entirely different mechanism, Hanshou Liu of the Goddard Space Flight Center made a mathematical analysis of stresses caused by pole movement relative to landmasses and derived the fracture lines. Unfortunately, he plotted them on a Mercator projection. If we remember that the principal property of the gnomonic is that all great circles are straight lines, and recall that the tetrahedron and the cube have common vertices, we can then plot the projection of a cube on this gnomonic tetrahedron. We find Liu's theoretical fracture lines, if replotted on our projection, show a good correspondence with the projection of a cube (below).

But now we come full circle to Alfred Wegener's jigsaw puzzles and the question of where to put the interruptions. If we choose for the interruptions plate boundaries and their correspondence with the icosahedron, we obtain the map at right which can be folded into a global form.

Science and art have met. Mathematicians and scientists seek to observe apparently diverse occurrences in nature and find some common basis which unites these happenings. They then depict them to "show" the common basis. Artists seek to render on a flat sheet the fundamental essence of the solid forms they observe in nature. Is it surprising, therefore, that from these two seemingly widely differing starting points, mathematics and art join?

Plato may have said it best long ago: "Measurement of lands is art."

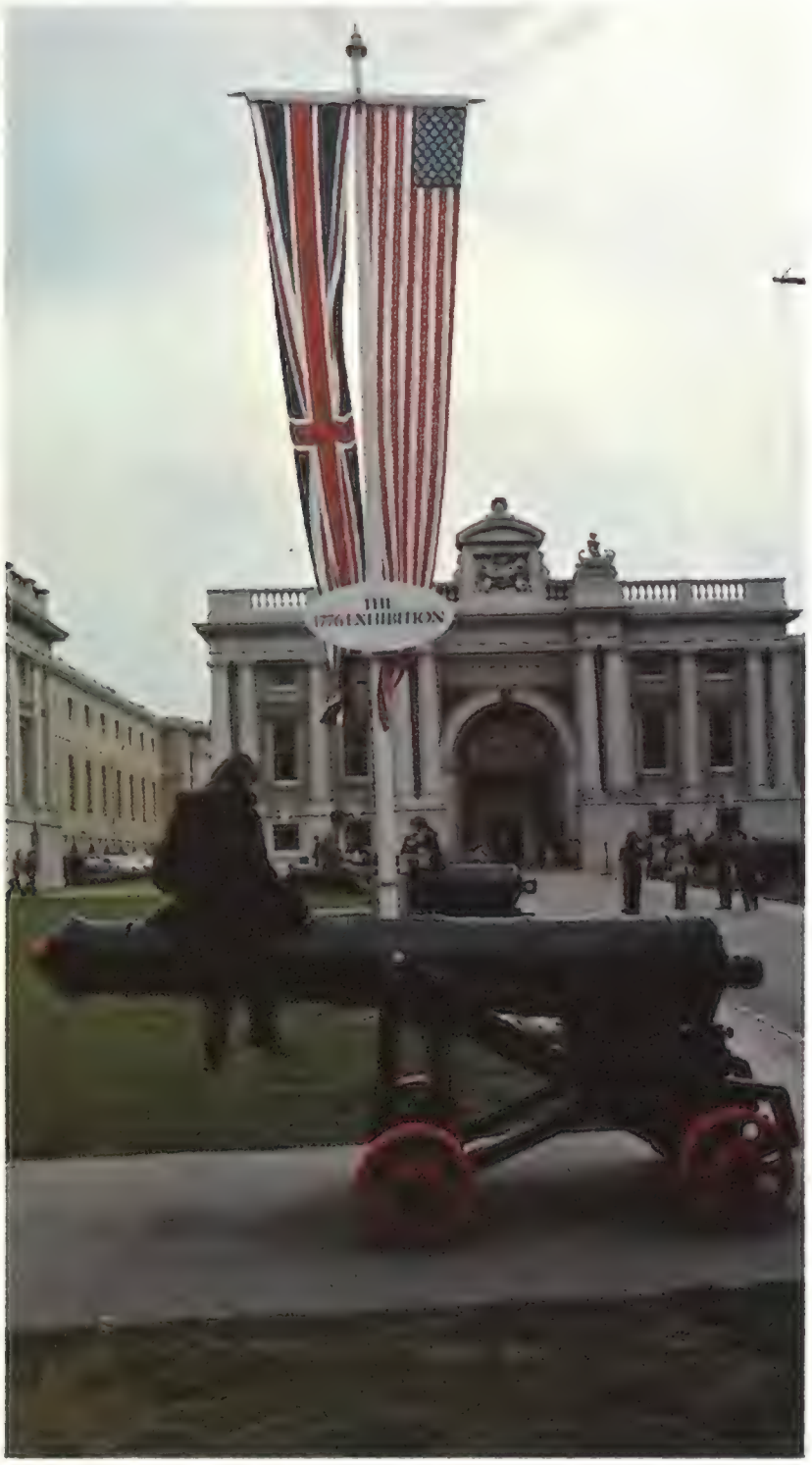


This map is nearly identical to the preceding one, except that the top and bottom right-hand corners have been cut and swung over to form the familiar rectangle. On it are plotted, in red, fracture lines predicted by mathematical analysis of stresses in the Earth's crust. On this map the fracture lines come startlingly close to the projection of a cube, the straight lines shown here in black.

Here our globe is represented on a flat surface as the 20 triangles of an icosahedron. If this map were cut out and pasted on heavier paper, it could be folded along the triangle edges to form a globe at once more familiar and at the same time more revealing about the realities of our planet. The triangles correspond closely to the crustal plates and the folds along the edges to the plate boundaries and rift systems. This particular arrangement is arbitrary; the top triangle, for example, could be cut off and attached to the bottom. As an aid to assembly, one set of latitude markers is printed in boldface type.

By Timothy Green

The British view of 1776 and all that: Greenwich, 1976



Britain's National Maritime Museum, once a royal palace, is devoting 23 galleries to exhibition.

Benjamin West's *The Cricketers* shows Colonials in England in 1763. Allen brothers (left) and Ralph Wormeley (far right), of whom little is known, stayed loyal. One Allen fled America, one died. Arthur Middleton (center) and Ralph Izard joined the rebels

Cherished paintings and mementos exhibit the other side of a war between brothers, and celebrate today's bond between nations

Private collection

Most nations, naturally, like to celebrate their famous victories and quietly forget their defeats. So British schoolchildren have always cut their historical teeth on Drake licking the Spanish Armada, on Nelson's victory at Trafalgar. Ask them who was the winning commander at the Battle of Saratoga or at the Siege of Yorktown, and the answer has not come so readily, at least not until this year.

The British have decided that the Bicentennial birthday party across the Atlantic must not be allowed to pass without due ceremony in England, too. The losers, therefore, have set about telling their side. Hence a massive exhibition at the National Maritime Museum at Greenwich, just down the River Thames from the heart of London, is called "1776, The British Story of the American Revolution." It was conceived

Photographs by Dmitri Kessel

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West's portrait of King George III in uniform of Commander-in-Chief is from Queen Elizabeth's private collection. She has lent more items to the Greenwich exhibition than anyone else.

by its chief sponsors, Times Newspapers Limited and Barclays Bank, not just to retell history, but to underline the continued affection and strength of Anglo-American relationships.

Sir Denis Hamilton, chairman and editor-in-chief of Times Newspapers Limited, writes that "the serious student and the wondering child must be gripped for an hour by the story of how Britain lost a colony yet, in fact, was handing over to the United States its ultimate destiny to assume one day the leadership of the English-speaking world."

To that end almost 600 paintings, maps, secret documents, military uniforms, muskets, swords and cannon have been assembled through 23 galleries at the National Maritime Museum. The assortment ranges from Ben Franklin's traveling chess set, George Washington's medicine chest and a silver teapot made by Paul Revere, to one of those elegant sack-back Windsor chairs that Francis Trumble made for Independence Hall. The sea cabin of the British naval commander, Admiral Lord Howe, aboard the *Eagle* in New York harbor in 1776, has been re-created and fitted out with his sea chest, medicine cabinet, sword, telescope, decanters and port bottle (p.70-71). And the documents in Benedict Arnold's own hand giving the disposition of the batteries at West Point, which revealed Arnold as a traitor when they were found in the boot of his

British Museum, London

A Hessian Grenadier with extra-long pigtail
is laden with loot, seized from friend as well as foe.

British Museum, London

Antirecruiting satire shows British soldier beset
by his sick, starving family and by lethal Yankees.

He gets sixpence a day; sedan-chair carrier
earns three shillings, coachman two and sweep one.

Goodwood Collections, Chichester, Sussex

The Hon. Cosmo Gordon, son of a Scottish Earl, is shown in uniform he wore in American campaign.

British contact Major John André, have been brought over from the New York State Archives.

The task of scouring Britain, France, Canada and the United States for the artifacts to bring to life the story of 1776 took the exhibition's director, Kenneth Pearson, and his wife, Patricia Connor, two years. They found it at once a frustrating and rewarding assignment. "There was just no way Americans were going to let go of their favorites during Bicentennial year," admits Pearson. "You might just as well ask King Arthur if you could borrow the Round Table for six months. But we had one great advantage over our American competitors, who were also hunting: South Carolina might tell New Jersey that it could not borrow an object, but we had come from London—the enemy. Americans found that quaint, amusing, droll, puzzling, eccentric—and they lent."

Nevertheless, the difficulty of borrowing well-known showpieces created a challenge to delve out long forgotten mementos from private collections. Much of what is on display has not been seen in public for two centuries, and perhaps may not be seen again for another two—if ever. Indeed, what has satisfied the Pearsons most is that they have been able to bring together many relics for the first time since the Revolution. "We've assembled from all over the place many of the uniforms and weapons, for example, that the British and the rebels wore when they faced each other at Bunker Hill," said Pearson. "It's actually the largest collection of military equipment since the war itself."

The heart of the exhibition is what has been ferreted out from museums, libraries and private houses in Britain and France. Unlike the Americans, who naturally cherished relics of the struggle, many Britons simply forgot their mementos. So the Pearsons searched through old army lists and *Burke's Landed Gentry* to try to tie together officers who fought in America with their descendants today. They gleaned some clues from old magazines and salesroom catalogs, and put a poignant advertisement in *The Sunday Times* asking people whose families might have served during the Revolution to turn out their attics.

Private houses throughout Britain—and especially in Scotland—proved to be hiding a veritable gallery of portraits of long-forgotten ancestors who had been officers in the American campaign. There is Lt. James Stewart, who served first with the 5th Foot and later with the Royal Highland Regiment, right through from Lexington and Bunker Hill to the Southern campaign in Florida and Charleston in 1782; Capt. Henry Knight of the 43rd Regiment, who fought at Lexington, Concord and Bunker Hill; and Lt. Col. The Hon. Cosmo Gordon, a grenadier with the 3rd Foot Guards, who saw action in the Pennsylvania and New Jersey campaigns under Howe.

They and their brother officers, now on parade again as "Gentlemen of the Mess," epitomize the young Britishers who served in North America, just as their American contemporaries are portrayed equally well in *The Cricketers* by Benjamin West (pp.64–65). This splendid painting, also culled from a private collec-

British Museum, London

Cartoon of 1776 satirizes current coiffures and also General William Howe's evacuation of Boston.

tion, shows five young men from the Colonies during their education in England in 1763. At that moment, as some lean at ease on cricket bats, they seem complete Anglophiles all. Yet in a little over a decade they were to be deeply involved in the Loyalist-Patriot confrontation. Andrew Allen of Philadelphia was at first an active rebel, but could not support the Declaration of Independence. He joined the British Army. His property was confiscated and he had to flee to London. His younger brother, James, also refused to support "the independents," but died before he could take much part in the war. Arthur Middleton and Ralph Izard, both from South Carolina, were destined to become members of the Continental Congress. The youngster, Ralph Wormeley of Virginia, was a marked Tory and held various British posts in North America.

The Cricketers thus captures the essential theme of this exhibition: "not a case of We and They" as one British critic put it, "but of brothers divided against brothers by the imbalance of an island the size of Britain trying to rule a continent the size of the United States 3,000 miles away."

This concept of kith and kin begins the Greenwich 1776 show. Instead of stepping immediately back into history, the opening gallery is filled with newspaper headlines ("They're off—626 GI Wives") and blown-up photographs stressing Anglo-American cultural and political ties. There are stills from *West Side Story, Oklahoma!* and *The King and I,* portraits of Louis Armstrong and Count Basie, Rhodes scholars, Dr. Benjamin Spock, Charlie Chaplin, T. S. Eliot, Dame Edith Sitwell, W. H. Auden and astronomer Fred Hoyle. The political partnership is underlined by pictures of John Kennedy with Harold Macmillan, Harry Truman with Clement Attlee, and a cheerful group of Franklin D. Roosevelt and Winston Churchill flanked by their commanders—Eisenhower, Montgomery and Air Marshal Tedder. Most arresting is a photograph of a grinning GI clasping hands with an elated British Tommy after the successful Anzio landing in 1944—the truest Atlantic Alliance.

Then you turn a corner and step back 200 years, smack into an ambush. On either side of a narrow corridor life-size rebels and redcoats are sniping at each other through the woods at night. You are caught in the crossfire, as a soundtrack rattles with musketry. For a second you recoil with shock, then step boldly into the world of 1776.

It was not always a pleasant world. Around another darkened corner is a life-size figure, tarred and feathered, his hands roughly roped above him to a gallows; (p. 71) all around are scattered tea chests. For the British customs man the job of trying to collect the tea tax could bring harsh responses.

The 1776 show is not just a display of paintings, guns and uniforms, but is conceived as a walk through the late 18th century. So there is a London coffee house, with snuffboxes and clay pipes on the tables, a piped-in aroma of coffee and sound effects of street vendors' cries and carriages going by outside. The newspapers and pamphlets scattered about catch the mood of the era. The *London Gazette* for Tuesday, January 9, 1776, leads with a proclamation by the King, "For encouraging seamen to enter themselves on board His Majesty's ships of war." A pamphlet carries "A letter to Edmund Burke Esq; contraverting the principles of American government; laid down in his lately published speech on American taxation."

Then onward, to the music of a harpsichord playing Handel's *The Harmonious Blacksmith,* into the court of King George III, the man Thomas Jefferson declared "unfit to be the ruler of a free people." We are reminded here that George was a profoundly civilized man, interested in music, painting and science. Here a richly brocaded alcove is decorated with the palette

Mr. Green has written for SMITHSONIAN *on such varied subjects as Trinidad's scarlet ibis and Britain's National Trust project (in 1975).*

of Sir Joshua Reynolds, first President of the Royal Academy (which George III founded) and with a handsome set of drawing instruments that the king once presented to his tutor. Presiding over this courtly scene is a larger than life painting of George III himself as Commander-in-Chief, a role he took extremely seriously. Around the painting are his military sword and his personal flintlock pistols, made by one of the finest gunsmiths of the day, Tow of London. All of them are from the private collection of his great-great-great-great-granddaughter, Queen Elizabeth II.

The army over which George III presided comprised only 48,000 men at the outset of the war, but was expanded, with difficulty, to 110,000 (of whom 56,000 served in America). Army life was harsh, underpaid and unpopular. Recruiting, we are reminded at Greenwich, was a thankless task. The recruiting officer could either try to con some gullible fool into joining the ranks by a good sales talk coupled with a small bounty and a shilling to drink the king's health, or he could persuade criminals to sign on for a pardon.

Those who signed on had a hard time making ends meet. A contemporary antirecruiting cartoon (p. 67) points out that for a mere sixpence a day (compared with three shillings earned by a sedan-chair carrier) the soldier had to endure "Yankees. Fire and Water. Sword and Famine." He was liable to be flogged with the cat-o'-nine-tails for any misdemeanor, although some generals, notably John Burgoyne, preferred more civilized punishments, such as extra drills or wearing coats inside out as a sign of disgrace.

An infantryman in full kit is shown landing in North America, humping a 60-pound pack complete with four days' provisions, water flask and cartridge box containing 60 rounds. His basic weapon was that old standby, the Brown Bess flintlock musket, which had been used in the British army since 1717. It re-

Admiral Richard Howe's cabin, aboard his flagship *Eagle,* is reproduced with his ornate sea chest, his port bottle and many other personal belongings.

Blue Ball Inn of York County, Pennsylvania, built in 1769, is here reconstructed as it looked when rebel militiamen met in it after drill.

Tarred and feathered, a British customs man shows one result of going after the duty on tea.

quired 12 separate movements to prime and load, but apparently a well-trained man was able to snap off five shots a minute.

Amidst the array of battle equipment brought together at Greenwich this year, a sign explains that "Every item of equipment needed to promote the war had to be shipped to America. . . ."

That headache was compounded when the French joined in. With the army and navy already engaged in North America, the threat of a French invasion across the English Channel by 1779 was very real. A hasty attempt was made to recruit a kind of local home guard, provoking a droll cartoon of the day entitled "Advance Three Steps Backwards. Or the Military Heroes," showing a one-legged, cross-eyed bunch of halfwits trying to learn to shoulder arms.

The linchpin in the American-French alliance was, of course, Benjamin Franklin, American Minister Plenipotentiary to the French government, who was busy raising loans and ordering arms. His chief gunrunning contact was the French playwright Beaumarchais (*Le Barbier de Séville* and *Le Mariage de Figaro*), who had a fleet of 12 ships working across the Atlantic.

By curious coincidence, Beaumarchais' eighth-generation descendant, Jacques de Beaumarchais, happens to be the French ambassador in London in 1976,

and has obligingly lent to the 1776 show some documents relating to his ancestor. There is a discreetly worded letter from John Jay, President of the Continental Congress, to Franklin about arms payments. "Sensible of Mr. Beaumarchais efforts to serve the United States," wrote Jay "and of the Seasonable Supplies he has from time to time furnished, Congress are earnestly disposed to make him this payment. They would gladly have done it in produce; but the State of our finances and the hazardous navigation render it impracticable. . . ."

France's military might is emphasized at Greenwich with a selection of relics from the famed Brunon Collection of French military equipment. Beside an assembly of muskets, pistols, swords and uniforms used by the French forces in America, is an intriguing Royal Order from Louis XVI on the payment and provisioning of "Troops for a special expedition, 20 March 1780." A final instruction warns, "His Majesty intends that only men fit and able to endure long sea voyages shall embark."

The hazards of the sea voyage did not deter some ladies from following their husbands to the war, as one of the most touching vignettes in this exhibition reveals. When Major John Acland of the 20th Foot Regiment was posted to North America, his wife, Lady Harriet, insisted on going along too. She soon proved herself his private Florence Nightingale. When he was wounded at Ticonderoga, she nursed him back to health. Then at the second Battle of Saratoga, Major Acland, a fiery fellow by all accounts, ordered his redcoats "Fix bayonets and charge the damned rebels." Leading his men, he was shot and captured.

A distraught Lady Harriet promptly went to General Burgoyne, who gave her a *laissez-passer* to cross into enemy lines to look after her husband. A faded painting shows her making her way up the Hudson at night to the rebel lines. The sentries, suspecting a trick, held her at bay until dawn, when she was allowed to land. General Horatio Gates, touched by her devotion, allowed her to look after her husband and, when he had recovered, arranged their exchange in return for an American officer of equal rank. The swap made Major Acland a firm friend of the Americans.

The war, indeed, caused many people to question which side they should really be on. Some British officers had become devoted to North America in the years before the struggle and were often uncertain where their real duty lay. Sir John Caldwell, lieutenant colonel of the 8th Foot, for instance, got on so well with the Indians that he was elected an Ojibwa chief and was given the name "Runner" (opposite).

Some Indians formed similar attachments. The Mohawk chief Joseph Brant was educated at Lebanon, Connecticut, mastered English, Latin and Greek, and later translated the New Testament and the Book of Common Prayer into his own tongue. In 1776 Brant traveled to London, where he was presented at court and became a great hit in society, turning up at soirees in full tribal dress. George Romney took the opportunity to paint a fine portrait of him.

Brant returned to America to fight alongside the British throughout the Revolution, earning an awesome reputation as a leader of raiding parties in western New York. Eventually, with peace, Brant and his tribe were resettled in southern Ontario.

The coming of peace called for many such readjustments, and the closing episode of the 1776 exhibition symbolizes the healing of the wounds. In June 1785, John Adams approached King George III to present his credentials as the first American Minister to the Court of St. James's. The remarks the two men addressed to each other on that auspicious occasion are heard again—recorded by Elliot Richardson, until recently U.S. Ambassador in London, standing in for John Adams, and the Prince of Wales, taking the part of his ancestor George III.

John Adams said his task was to restore "the good old humor between people who, though separated by an ocean, and under different governments, have the same language, a similar religion and kindred blood." The king replied, "I was the last to consent to the separation; but the separation having been made, and having become inevitable, I have always said, as I say now, that I would be the first to meet the friendship of the United States as an independent power."

Sir John Caldwell, commander of the 8th Foot in Quebec, was elected a chief by the Ojibwa and was painted in their regalia (detail opposite).

By Paul Brooks

New England's old way of life shapes Lincoln

Formed in 1754 out of parts of Lexington, Concord and Weston, it has never lost its strong ties to pre-Revolutionary times

Boston, some observers have suggested, is a state of mind. The small New England town, however, may be better described as a way of life. Obviously this is no longer so true as it was two centuries ago; in a modern suburb, as distinguished from a country village, the idea may seem farfetched. Yet the fact is that towns, like men, have their characters formed in their youth.

They may grow old and die, like the ghost towns of the gold rush, when the reason for their existence has come to an end. Or, if near big cities, they may die a different sort of death, not of starvation but of glut. Those that do survive, however, will have their own distinct personalities, based on their past. They will endure as communities with whom men and women can identify themselves, communities with ingrained attitudes established over many generations. Such attitudes are tough to eradicate, even in the name of what, at the moment, may be defined as progress.

Definitions change. Standards of value traditionally associated with rural New England no longer look as quaint as they did a generation ago. Though few residents of Lincoln, Massachusetts, would willingly change places with their predecessors, the way these people lived and thought will always be an element in the character of the town.

Composed as it was of outlying districts of three existing towns—Lexington, Concord and Weston—Lincoln not only began in 1754 as an agricultural community, but remained one well into the present century. It was founded at a time when, according to modern his-

The De Normandie farm, reminder of Massachusetts'

agricultural beginnings more than three centuries ago.

torians, the New England town was reaching its highest state of development in terms of a harmonious relation between Man and the land. Land was a family treasure to be cherished and parceled out, as contemporary deeds and wills bear witness, with meticulous care. It was also a public responsibility, the administration of which gave the townsman essential training for practical politics. Without such local experience, he never could have coped with the broader and far more complex problems that would be involved in the founding of a new nation.

Surviving inventories help us to imagine the physical character of the landscape as it appeared two centuries ago and to recognize the forces that shaped it. In 1784, when Lincoln was 30 years old, it contained 88 dwellings, and no fewer than 84 barns. About two-fifths of the area of the town was open land. Over a third of this was pasturage. Next in extent came the "fresh meadow" or native grassland (presumably low wetlands kept open by periodic controlled flooding). Finally, and most valuable, were the smaller areas given over to "English mowing," planted with seed imported from abroad, and to "tillage," cultivated land devoted to the raising of food crops.

In the early days of the Massachusetts Colony the principal crop was, of course, Indian corn, or maize. Cornmeal provided the staple diet, along with pumpkins, beans and peas—the last two often planted alongside the corn whose stalks served for beanpoles. Wheat, with which the Colonists were familiar at home, was soon introduced but was successful only in the more fertile areas and was subject to blight; rye was sturdier and better suited to light and gravelly soils. Barley was grown for the making of beer (the favorite drink before cider came into production) and oats for the horses. As the land was cleared and settled, the vegetable garden became a part of every home and the diet

The same rural scene, as sketched by the author.

Photographs by Marvin E. Newman

of the New England farmer achieved a considerable variety. Here is a recollection of one such garden as it must have been at the end of the Colonial period: "a wilderness of onions, squashes, cucumbers, beets, parsnips and currants, with the never-failing tansey for bitters, horseradish for seasoning, and fennel for keeping old women awake in church time."

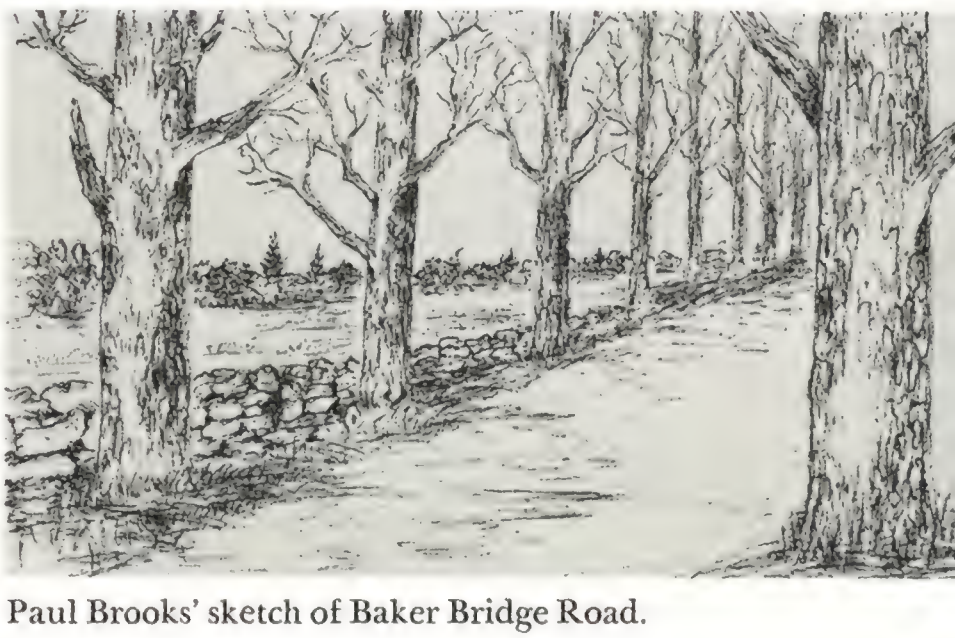
Returning to the Lincoln inventory, we find that woodland, comprising three-fifths of the total, was divided into two almost equal categories: "improved" and "unimproved." A small residue—which must have been really rough—is described in the town records with apparent resignation as "unimprovable."

Soil conditions varied greatly in different parts of the town. "Lincoln has all the varieties of soil, from the richest to the poorest," writes an early 19th-century historian. "Though rough and uneven, it contains some of the best farms in the county." The Lincoln farmer by the time of the Revolution was cultivating, on the average, about six acres of land: the amount that could be efficiently worked with one pair of oxen. Thomas Brooks and his son Noah together held 10 acres of tillage, 28 of mowing and 32 of pasture. The inventory of the estate of Jabez Stratton, a farmer and mill owner who died when the community was a week old, estimates his land at 75 acres. His "quick stock" consisted of "one grizld cow, one red Ditto, lyned back cow, Brown cow, one pair oxen, one Horse, one pair stears, one heifer, two yearling stears, one sow, two barrows [castrated pigs]."

Next to its stone walls, perhaps the most characteristic and most beautiful feature of the cultivated New England landscape was its apple orchards. Their extent can be judged by the fact that, in the Revolutionary period, Lincoln farmers were annually pressing some 800 barrels of cider, not to mention the variety of apples which, by drying or winter storage, could be eaten throughout much of the year, and even exported. John Adams, according to his descendant Charles Francis Adams, drank a tankard of hard cider every morning before breakfast. When James Barrett of Concord made his will, the provision for his wife included four barrels of cider a year, or about three pints a day. As the winter wore on, cider stored in the cellar gathered strength; if a man acted a bit frisky, it would be remarked that his cider was getting hard. And when the temperance movement eventually seized hold of the country in the mid-19th century, whole orchards were cut down with misdirected zeal on the assumption that hard cider was their only product.

With its well-kept orchards and fields of waving grain, its rolling pastures and lush level grasslands, the landscape of New England, by the late Colonial period, had become civilized to the point where visitors from Old England felt at home. The redcoats who would soon be marching on Concord would find it rough and hostile, with its thickets and stone walls so well suited to guerrilla warfare, but there was also much open country, kept so not for esthetic reasons but because the most important single crop was grass. It was the native grasslands that first lured settlers to the site of Concord.

The corner which, together with bits of Lexington and Weston, was to become Lincoln had no extensive water meadows, but a surprising proportion of it is natural swamp and bog, as the early farmers knew and as recent sophisticated studies have demonstrated in the course of mapping the town for wetland zoning. Where open meadow did not exist it could be created and maintained by artificial means. Talking with old-timers, one sometimes realizes with a shock how much our local landscape has changed. East of my house lies a long belt of swampland down the center of which flows a sluggish brook or ditch; the muck is deep and



Paul Brooks' sketch of Baker Bridge Road.

walking is best when the ground is frozen. Today it is covered with a dense growth of hardwood. But an elderly neighbor recalled a conversation many years ago with a farmer who, as a boy, had carried jugs of drinking water to the men who were cutting hay on this very spot.

Remains of dams and drainage ditches all over town remind us of how farmers in bygone days used to flood such areas every year to keep the trees from coming back, and then drain them to allow the grass to grow. Evidently they brought this technique with them from England; the diary of Adam Winthrop, John's father, refers to "drowning the meadow." So with the cranberries. Close by that swamp which was once an open field lies a small cranberry bog that generally has yielded enough berries for our children to make Thanksgiving jelly. It is one of more than a dozen abandoned bogs that have been harvested within the memory of Lincoln residents. Most are now grown up to woods, indicating that they, like the grasslands, had to be managed in order to survive.

The wetlands also determined the pattern of our town roads. By necessity, roads followed the high ground, as did the historic highway from Lexington to Concord; this was before the days when roadways were cut and filled regardless of the contours of the land.

If Europeans found the New England scene familiar and therefore pleasing, it was not because of any conscious effort on the part of her citizens. It was rather the result of a way of life. Wise and thrifty use of land had produced a beautiful landscape, as it had generations earlier in the English rural villages, the hill towns of Italy, or the terraced gardens of Japan. The spareness of the soil, the scarcity of usable land, meant the farmer thought in terms of living *with* his land, not simply living *off* it. From the beginning its possession was his pride, a symbol as well as a livelihood.

Stone walls still border a Colonial roadway.

Old Town Hall houses Lincoln Center post office.

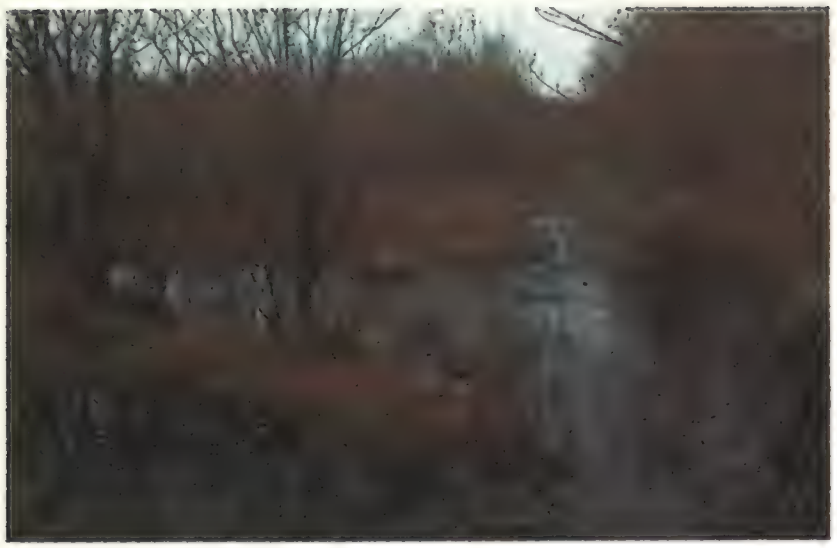
Neither fields nor village, of course, took shape overnight. It must have been years before the rotting stumps were cleared from the village green, and generations before the dooryard elms—though they are fast-growing trees—reached their full grandeur. Nor were these early villages so manicured and pretty as later reconstructions and lifeless imitations might lead one to believe. The Colonial cottage, white with green shutters, set off by a neat lawn surrounded with a picket fence, never existed outside latter-day real estate advertisements. Before 1800 few houses were painted, though some were stained red or green.

A typical village house of the Revolutionary period was, in the memoirs of one who knew it, of the "dun complexion assumed by unpainted wood, exposed to the weather for 20 or 30 years, save only that the roof was tinged a reddish-brown by a fine moss that found sustenance in the chestnut shingles." No lawn—just a split-rail fence to keep out the cows. Nor did the house front on a tree-lined street; that, too, was a development of the 19th century. Virtually every house had its barn; today the few that remain are priceless.

Obviously the farmer in Concord or Lincoln, in contrast to his brother in Boston, was dependent for his daily fare on the produce of his own acres. Wild game was abundant at the beginning, but soon declined; that magnificent symbol of Puritan New England, the wild turkey (a bronze-tailed bird far more beautiful than his domestic English cousin), had all but disappeared by the end of the 17th century.

The principal game bird, to be reduced by Man's greed from unbelievable abundance to extinction, was

© 1976 Paul Brooks, from The View from Lincoln Hill: Man and the Land in a New England Town, *to be published this month by Houghton Mifflin.*
Author Brooks, a conservationist, lives in Lincoln.



Periodic flooding kept cranberry bogs alive.

of course the passenger pigeon. "The cheapest of all the several kinds of poultry," recounts a visitor to Boston in 1740, "are a sort of wild pigeon, which are in season the latter end of June, and so continue until September. They are large, and finer than those we have in London, and are sold here for eighteen-pence a dozen, and sometimes for half of that." Lincoln took its own small part in the infamous slaughter of the passenger pigeon. In a corner of my woods there is a small rise known as Pigeon Hill. Once it was shaded by great oaks; here huge flocks of these lovely birds would stop to roost on migration, the branches bending under the weight of their numbers. All that now remains of their passage is their name.

The incredible numbers of these so-called "game birds" vanished with the wilderness, in New England as elsewhere throughout America. The Puritans doubtless considered this a loss, since the birds were worth eating. As to other species, I doubt that they or their descendants were aware that, by opening up the forest, by creating meadows and orchards and forest edge, they were providing a variety of habitat that greatly increased the abundance of songbirds: bobolinks and meadowlarks in the fields, orioles and bluebirds in the orchards, warblers darting among the treetops, swallows snatching insects from the air.

Whether the farmer recognized it or not, these insect-eaters were his friends. He had no trouble, however, in recognizing his enemies: the grain-eaters that descended on his crops. Concord was not long in urging upon her selectmen "that incorigment be given for the destroying of blackbirds and jaies." A century later Lincoln, by then an independent town, followed suit, and established a bounty "to encourage and bring forward the destruction of those mischievous birds called the Black Bird and the Crow," with the macabre provision that sixpence be paid "for each Crow that is feathered and three pence for each young Crow not feathered." In 1818 the state legislature passed an act prohibiting the killing of birds, but providing for suspension of the act by town governments. Regularly Lincoln voted "to kill Birds as usual." Nevertheless the crows and blackbirds and jays, unlike the turkeys and passenger pigeons, have conspicuously held their own as a permanent part of our landscape.

The great mammals have not fared so well. Thoreau keenly felt their loss. ". . . When I consider that the nobler animals have been exterminated here,—the cougar, panther, lynx, wolverene, wolf, bear, moose,

A water-powered mill operated on this site.

deer, the beaver, the turkey, etc.,—I cannot but feel as if I lived in a tamed, and, as it were, emasculated country. . . . As if I were to study a tribe of Indians that had lost all its warriors." He was wrong, however, about the white-tailed deer. Although by the early 18th century it had been so reduced in Massachusetts that a closed season was established—enforced by wardens or "deer reeves"—it recovered spectacularly in the cut-over forest, since it flourishes on low, tender new growth. Today the problem is one of overpopulation, for the other "noble animals" that once kept it in check are no more.

No community can live by farming alone, least of all a colony 3,000 miles from the mother country. The New England town, like the English country manor, had to be in most respects self-sufficient, with its own industries and trades. As early as 1658 a company was incorporated "to erect one or more iron-works in Concord," to exploit the local bog iron ore. Lime was quarried in several parts of the town. Remains of two such quarries can still be seen in Lincoln, and in Concord's Estabrook Woods are the foundations of a lime kiln, mentioned in Thoreau's *Journal*. Bricks soon replaced daub and wattle in construction of chimneys;

long before Lincoln separated from Concord, a brickyard was operating in the northwest corner of town.

Lincoln, like other villages, had its own masons and carpenters, its blacksmiths and coopers, its rope makers and cordwainers (shoe- and saddlemakers), its sawmills and gristmills and, close by the brickyard, a prosperous tannery operated by one of the leading families. It had its local weavers and dyers; there is also a reference in the town records to a "woolen factory," where presumably spinning, carding and fulling went on.

One tends to think of the Puritans as dressed in sober black and white. Actually they loved color, and they found dyes for their woolens close at hand: brown and yellow from red oak or hickory bark, crimson from the juice of the pokeberry, orange from the sassafras, purple from the iris. And by the end of the 17th century they had indigo from Barbados—a deep blue which, mixed with goldenrod and alum, also provided a beautiful green. The gentry, of course, imported fine clothes from England: silk and lace, gold and silver thread, ruffs and ribbons and "other superfluous trimmings" in the words of an early statute forbidding the wearing of such finery to all but the rich and well-born. It was not, in any case, likely to be seen in Lincoln,

Meadows, orchards had the look of Old England.

a town of yeomen and artisans dressed in homespun.

A Lincoln inventory just before the Revolution lists nine "work Houses" as distinguished from "dwelling Houses." We get a broader picture of industry throughout the Concord-Lincoln region in the detailed list of manufactures compiled during the war in a futile attempt to hold down prices. They include tow cloth and cotton cloth and woolens, felt hats and "Good yarn Hose for men," shoes and saddles, pots and pans, and charcoal at ten shillings the basket. In the years following independence, Concord developed into a considerable manufacturing center. Here were produced iron and steel, lead pipe, guns, "brass time pieces," lumber, boots, hats, and many other commodities for export. A cotton mill was built as early as 1805. Among later products were the famous lead pencils whose manufacture Thoreau briefly carried on with something less than enthusiasm.

Though Lincoln did have some export industry—including in later years a glassworks and a pickle factory—it remained, in comparison with its mother town, a rural community, bound to the rhythm of the seasons. In winter, ice was cut on Flint's Pond. As the sap began to rise, the maple trees were tapped for sugar. Corn was planted when the woods awoke in the pastel colors of spring and the budding oak leaves had reached the size of a mouse's ear. The first hay crop was harvested in June; blueberries ripened in July and corn in August; cranberries in the bogs and apples in the hillside orchards grew red as summer turned into fall. With them came what Thoreau called the greatest crop of all, the falling leaves. "This, more than any mere grain or seed, is the great harvest of the year. . . . I am more interested in it than in the English grass alone or in the corn. It prepares the virgin mould for future cornfields on which the earth fattens. They teach us how to die."

Once the land has been settled, farming communities tend to grow slowly. When it was founded in 1754, Lincoln had a population of 690. Fifty years later the figure was 750—a growth rate of approximately one person per year. In 1904, the 150th anniversary, there were still only about 1,100 people living on 15 square miles—almost eight acres for each resident.

The church was of course the unifying force in the settlement of New England. Here, in the words of John Cotton, was to be a "Garden of the Saints," hedged in from the untamed wilderness—a concept that fostered both brotherly love and unbrotherly in-

Many Lincolnians lie in town hall cemetery.

tolerance. This religious fervor cooled off with the decline of the Puritan movement.

Throughout New England the meetinghouse or "House of Worship"—the building itself was never called a church—was for many generations a principal focus of social as well as spiritual life. It served the purpose of a "superparlor" (to use J. B. Jackson's metaphor) where the "superfamily" or church congregation met at least once or twice a week. There were two long services on the Sabbath; the "nooning" or "horse-shedding" during the intermission, when friends would adjourn to the horse sheds for gossip, was the social event of the week.

In Colonial times, churchgoing could be a rugged business. In winter it involved not only riding or driving or tramping through the snow, but also sitting out the interminable sermons in freezing cold with one eye on heaven and the other on the sand in the hourglass that was placed in the pulpit. Samuel Sewall records in his diary "an Extraordinary Cold Storm of Wind and Snow. Bread was frozen at Lords Table." Not till early in the 19th century did meetinghouses begin to be heated; Lincoln's meetinghouse installed a wood stove in 1827.

Yet apparently in the absence of other diversion or cultural gatherings, church was considered to be fun. It provided an occasion for singing in a society that generally eschewed music as vanity. Sermons were expertly criticized, and preachers were held to a high professional standard of learning and use of language that would make many a minister today quake in his pulpit. By the same token, parishioners had to show them respect. In Concord, John Hoar was fined ten pounds in 1668 for describing the minister's blessing of the congregation as "no better than vain babbling."

The younger members of the congregation may have attended less closely to the sermon, but there were other attractions. On a lucky day, a dog might elude the tithing-men posted at the meetinghouse doors and disrupt the service. More mature pleasures are suggested by the reprimand delivered to a youth in the venerable town of Ipswich for "taking of the maids by the aprons as they came into the meeting house . . . putting his hands on their bosoms."

Solemnity and sociability were not incompatible. The funeral of Lincoln's first minister, William Lawrence, was observed with pomp and feasting; colleagues and friends of the deceased came from afar to join his parishioners in generous tribute, the dimensions of which can be envisaged from items listed in the town records. They included 500 pounds of English hay (for the visitors' horses); quantities of veal, pork, butter and cheese; both Indian and rye meal, with "3 women to cook." Solace was provided by a barrel of cider, a gallon of wine and a gallon of rum. The installation of Dr. Lawrence's successor, Charles Stearns, was more liberally supplied with drink, as befitted a joyous occasion: nine gallons of wine and five gallons of rum, along with tea, coffee, chocolate, spices, pipes and tobacco.

Early New England ministers were anything but puritanical when it came to drinking. The Reverend Ezra Ripley, successor to William Emerson in the Concord pulpit, waxed indignant if rum were lacking at a funeral where he presided. His personal household accounts were consistent with his public position. For a single month they ran thus: "1 gal. N.E. rum, 1 gal. wine, 1 gal. W.I. rum, 2 lbs. coffee." Edwin M. Stearns, Dr. Charles Stearns' grandson, recalled at the time of the 150th anniversary: "As a rule, those old-time reverend gentlemen seldom undertook to preach a sermon without their preliminary toddy. Indeed, it was considered such a necessity that when my father commenced preaching my mother received the following injunction from Grandmother Stearns, viz., 'Betsey, never allow Daniel to go into the pulpit until he has had his rum.' "

Liquor and feasting aside, the career of Dr. Stearns had special significance in showing how the personal qualities of a minister could reflect—and to some extent shape—the character of a town.

His reputation reached beyond the borders of Lincoln. Scholars respected him; he was even approached as a possible candidate for the presidency of Harvard. He declined to be considered; he was content where he was. His flock was content also. When at length he went to his reward, he left his stamp upon them and upon their town.

Apple orchard still lives on Lincoln's Bedford Road.

By Alexander Eliot

Rare drawings by Michelangelo found in crypt

Discovered by accident, they immediately set off a controversy—but experts now lean toward accepting their authenticity

Of course miracles happen every day, but all the same this did seem special to me. I write of the discovery of 56 charcoal wall-drawings, believed to be by none other than the supreme Renaissance master Michelangelo, in a barrel-vaulted storeroom below the Medici Chapel in the Florentine church of San Lorenzo.

For reasons which will become apparent, this report is necessarily somewhat preliminary in content, as compared with the volumes of in-depth research that are sure to be lavished on such a tremendous find before too much time has passed. There will be controversy as well; already one critic, according to *Art News,* has dismissed the drawings as "scribbles by his potboys" and not from Michelangelo's hand at all. But the enthusiasts have a strong case to make, and I am in excellent company when I pronounce myself to be wholeheartedly in the positive camp on this question. Dr. Redig de Campos, for instance, the director of the Vatican Museums, has told reporters that in his opinion the drawings are "certainly by Michelangelo." De Campos further believes that "Michelangelo used the place as his workshop and storeroom while working in the Medici Chapel above, and he made the drawings to develop ideas or simply for fun."

A personal note may be in order here. Ten years ago I wrote the script for a television special on Michelangelo's Sistine Chapel ceiling, which was first sponsored by the American Council of Catholic Bishops. Through the bishops I was given at that time an inestimable privilege: a tower on wheels, 60 feet in height, was built at my request in the Chapel, and my wife and I spent weeks alone together on top of the tower, studying the ceiling from within touching distance. Up there I learned just how Michelangelo drew his figures *in situ* for fresco painting. The contour marks left by his knife in the wet plaster are clearly visible from close at hand; one can follow the corrections he made during the progress of the work, and witness how the colors (which appear marvelously transparent from close up) often overlap the underlying graphic work. It was at that time that I became acquainted with Dr. de Campos and found reason to respect his considered judgment.

No wonder, then, that when I read the news of his

Two restorers work at cleaning the drawings, which line the walls of this narrow room beneath the Medici Chapel in Florence. Entrance from stairway is at right; square object is housing of an old well.

having personally authenticated the charcoal drawings in the cellar of San Lorenzo, I made it my business to follow up the matter. The press account which I had read credited the discovery to Dr. Paolo Dal Poggetto, director of the Medici Chapel. Accordingly, I went directly to Dr. Dal Poggetto. A warm-eyed and scholarly connoisseur, still young and obviously shaken by the limelight of fame, Dal Poggetto ascribed his discovery to *fortuna cercata*. The phrase is not really translatable, but it implies good luck ardently and sensitively searched for. Only last year he began wondering if it might be possible to create a new egress from the Medici Chapel to the street, instead of requiring visitors to retrace their previous steps against the pressure of the incoming throng. With 3,000 or more tourists oozing round the chapel on a typical summer's day, it seemed to him that something had to be done. At that point an old-timer among the Chapel guards suggested clearing out the junk-piled storeroom just behind the Chapel in order to see whether there was any truth in the old accounts that a second storeroom existed just below the first one. Because, if that were so, then a flight of stairs might be constructed down through the second, hidden, storeroom to street level.

It seemed worth trying. The first rubbish-filled room, when cleared at last, did in fact reveal a narrow trap door, which, when tilted back on its rusted

Photographs by Dmitri Kessel

Dr. Paolo Dal Poggetto's efforts to create a new exit for Medici Chapel led to discovery.

hinges, showed a ladderlike stone staircase leading down into the darkness of a still more junk-crammed room. When that in turn had been emptied, it proved to be a long narrow cell with a rounded ceiling, moldy whitewashed walls, a well sunk in the floor at one side, and a couple of low, well-barred arched windows leading to the out-of-doors. Gazing around that dingy little room in the autumn cold, Dal Poggetto thought that possibly Michelangelo himself had stood in precisely the same place long ago. "Scrape down the walls," he ordered, "but do it little by little [*poco a poco*], just in case the whitewash conceals some record of the master's own hand." That was so done. A 19th-century coat of whitewash was removed, and beneath that a second coating which apparently dated from the 16th century. Under this layer, almost at once, charcoal drawings appeared which were in Michelangelo's style.

The news spread, some photographs were published (prematurely, it seems in retrospect), and these became the subject of some gossip and many reservations in art historical circles. More cautious now, Dal Poggetto imposed a conspiracy of silence upon his two chief restorers, and put them to work scraping down the entire room. This labor took three and a half months, and by then most of the winter had passed. What finally stood revealed upon the walls was utterly convincing to Dal Poggetto himself: a constellation of half a hundred separate studies—some large, some small, some overlapping and some not—which seemed to transform the little storeroom into a secular black and white chapel, although it could be seen to contain no very ostensibly sacred images.

The practiced eye of Dal Poggetto recognized swift linear reflections of Michelangelo's previously known works on every hand. He set about having photographs made of each and every detail, and writing detailed notes on everything there, as rapidly as possible. Charcoal is a very ephemeral medium. The whitewash had preserved the drawings, like new, for centuries; but now there was no telling how long they would last upon the walls. This gave Dal Poggetto reason for haste. He recalled, of course, what had happened in the cavern at Lascaux, where Cro-Magnon images dating back as much as 30,000 years (and which were originally created in charcoal, among other more painterly mediums) had been partly destroyed by the mere breathing and sneezing and bacteriologically active auras of thundering herds of tourists. The cavern had to be closed down. Something similar could happen here.

Accordingly, Dal Poggetto sternly forbade all further premature press leaks of his discovery, and made that stick with very few exceptions. He was meanwhile putting together an elaborately documented account of the whole matter, which he has since published in the Tuscan art journal *Prospettiva* (April 1976). He aimed to follow that up with an international press conference, and to permit a very few carefully culled critics to view the actual storeroom thereafter for a time. The longer-range problems of preservation and exhibition were not yet settled, I gathered, in Dr. Dal Poggetto's mind. They would be very difficult, he understood, and perhaps even insurmountable in certain respects. For example, there might never be a way to open the doors of this little room to the public at large.

And now, meanwhile, what was he to do about my own visit? Dal Poggetto happens to be a Florentine of the old school; chivalry seems second nature to him. The upshot was that he invited us to view the miracle personally in his company, but under certain very stringent conditions. First, we were to ask no questions; second, we were to make no photographs or even sketches. Only in this way, the director told us regretfully, could he extend a special courtesy to us while still keeping within the ground rules which he himself

Alexander Eliot, a free-lance writer who lives in England, is a former art editor of Time *and author of* Three Hundred Years of American Painting.

had imposed previously in the interest of discretion.

With that, we went down together. Dr. Dal Poggetto produced one key after another, heaved open the trap door and, warning us to watch out for fear of falling in the narrow stairwell, preceded us down and around the last shadowy corner to snap on the lights below. Am I being extravagant when I state that the following few moments were among the most astonishingly beautiful of my whole life? That is the way I feel about the matter, anyhow. A shock of recognition—human recognition, I mean, having nothing to do with the chill nod of satisfied connoisseurship—was what came to me, as if to say: "Mere Man is capable of this!" We spent little over an hour in the room within Michelangelo's visible embrace of fellowship, and by the end of that time the refreshment which those images gave me had left me limp with exhaustion, so that I really had no desire to look at them any more.

Perfectly free improvising

All this having been confessed at the start, I will proceed to recollect what was there as objectively as possible. It is not easy to convey the actual scale of art works, nor to demonstrate where and how they interrelate, or what their "surround" may contribute to the entire effect. So words can help. I could not report the precise measurements of the room, but Dr. Dal Poggetto has described it as 33 feet long and nine feet wide. Reaching up, one can easily touch the apex of the barrel vaulting. The whole effect is intimate, in short, and might seem cramped but for the brilliant light, the complete emptiness and, not least, the effect of other spaces leading right out through the walls, which the drawings produce upon one's consciousness. That there are actually 56 separate drawings along the walls one wishes to take on faith, for to count them would be a waste. The fact is that the drawings come in all sizes, from larger than life to the relatively minuscule, and furthermore a good many of them overlap, so that one finds it hard to sort the images out.

Reflecting on this, one can only conclude that the work done here must have been very like play—or call it perfectly free improvising. Here Michelangelo seems to have drawn whatever "came to him," as it were, in no particular order or intentional relationship. Yet, his genius being what it was, he could not create an ugly or unbalanced composition. Hence, wherever in the room one's glance may rest, a rich and glowing harmony of lines—harmony distinct from the images themselves—slowly makes itself felt. Michelangelo was not only a supreme draftsman of the human figure, but also a master of space and architecture who "designed" as naturally as he breathed.

The room holds nothing but figures and faces,

Despite variations, these legs are remarkably similar to those on Michelangelo's statue of Duke Giuliano in the Medici Chapel. Dal Poggetto believes it is a preliminary sketch for the statue.

from end to end, except for one horse's head. Mankind was Michelangelo's subject, it would seem; and a psychologist might add that on the evidence presented here the artist must have been obsessed with physical images of nude men and women. In point of fact, though, Michelangelo himself strove from the beginning to the end of his very long working life to body forth ideal states and supernatural powers through just such images; they represent a great deal more than flesh and bone. The artist was imbued through and through with the Platonic idealism which so elevated Florentine culture under the Medici.

Just a few of the drawings on the walls are caricatures of a lighthearted kind, and therefore possibly by someone else; Dr. Dal Poggetto thinks it wise to suspend judgment on them for the time being. In general, the wall drawings in the room are serious and yet vibrant with liberty. Among them are many which present limbs alone, or other living fragments of Man, while not a few plainly deal with problems of foreshortening which amused the artist.

But that is enough of generalities. Consider first, for example, the figure immediately to the right of the stairwell door (p. 87). This larger-than-life male nude appears to have just sprinted downstairs and sprung around the corner into the room. One of his hands has barely parted from the doorpost; the other swings free at his side; and both are shown seemingly in two positions at once, as if the artist were unable to decide just what to do with the figure's extremities. No, on the contrary; the artist appears to have been taking advantage of the hidden, private conditions in the room in order to make a large-scale contour study of motion itself; how human bodies disport themselves. But by having implied that the drawing is a study in motion, eminently successful though it be in that respect, I unfairly limit and denigrate the whole matter. For this is

It has been suggested that the female figure in the center of the back wall, with one leg bent and no mere study with which the master presents us, after all. One can hardly help feeling, as one looks at the few charcoal lines in question at the moment, that an angel has just swung down the stairs into the room.

That, in turn, calls to mind the *Ignudi,* the great nudes which surrounded and adorn the vault of the Sistine. They are not realistic in any labored sense of the term, nor do they give an impression of fleshly masculinity. Like the generous sketch upon the cellar wall, they appear to be spiritual and asexual creatures which the artist envisioned; and a modern disciple of Karl Gustave Jung would hardly hesitate to describe them as "archetypal projections" from the profoundest and therefore most universal depths of Michelangelo's own unconscious.

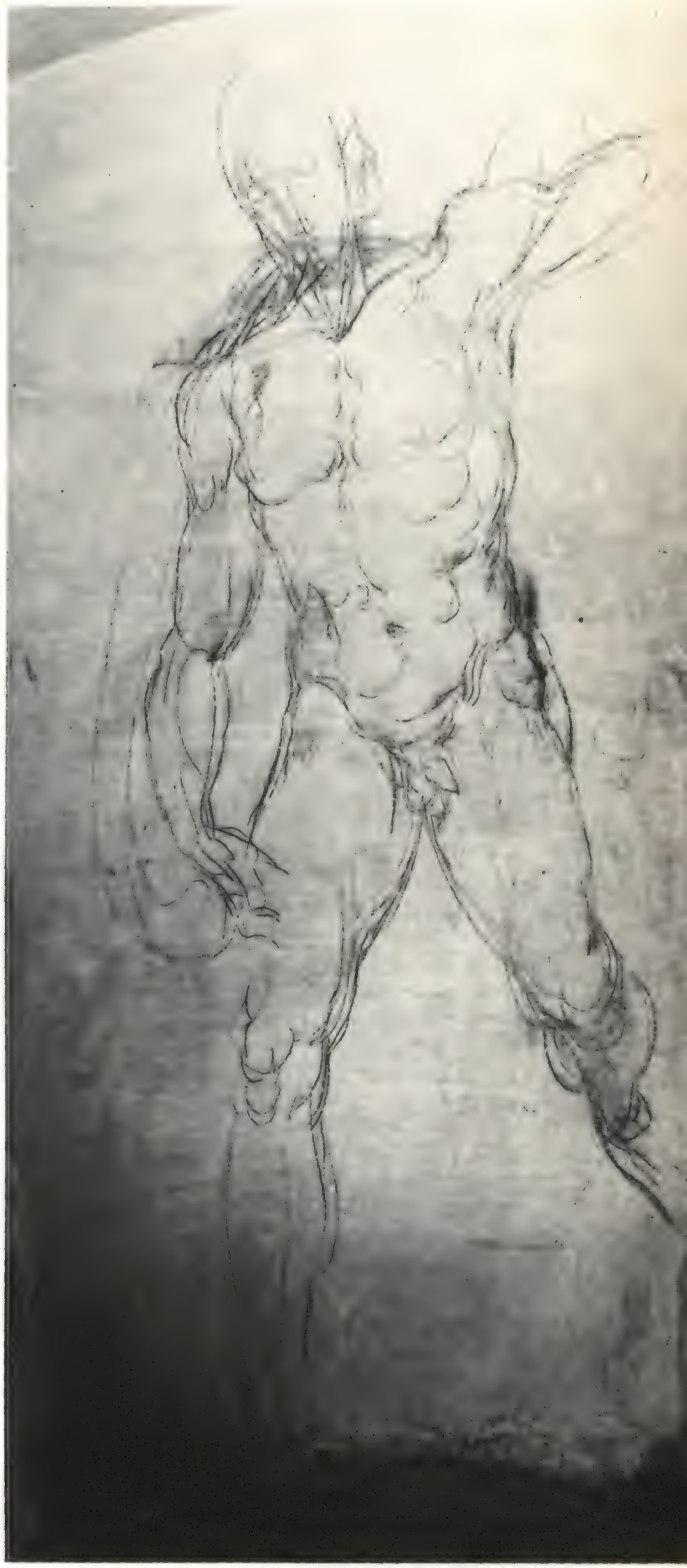
Where we see bodies, he witnessed invisible forces at work and play. The Angel at the Foot of the Stairs (that is what I call this particular figure in my own mind, although Dr. Dal Poggetto thinks of it as the risen Christ), seems anything but bodiless; indeed it is so roundly defined that Michelangelo's charcoal strokes at the most difficult parts—as for instance the socketing of the hips—might almost be taken for chisel-marks. Still, to repeat my thesis, this figure represents

the other supporting her weight, is Diana. The face just to the right may be a close-up of her profile.

the artist's own intuitive vision of matters which remain invisible to ourselves. Internal evidence convinces me that it should be regarded as a kind of vision, swiftly outlined in a spirit of reverence.

The same thing goes, I'd better add at once, for the majority of the drawings one finds there in the room. Any openhearted visitor to this shrine of the future—for shrine it is certain to become—will leave the precinct convinced that Michelangelo himself had something cosmic about him, something which transcended the single and parochial world-view into which he was born. For, if this man really "belonged to the Italian Renaissance" altogether, then no one unfamiliar with European Christian culture could possibly grasp what he has to give; whereas in fact the contrary is true, and a Buddhist or Sufi might well feel quite at home among these images of the spiritual world—which, note well, contain no single overt hint of Christianity per se.

Consider, for instance, as your eye roves to the right along the cellar wall, that large yet very swiftly sketched image of a seated figure who listens intently to someone standing just in back of his shoulder. Is that the Apostle Matthew taking dictation from the Angel of God? Yes, according to Dr. Dal Poggetto's



In Dal Poggetto's view, this beautiful drawing beside the door represents the risen Christ.

estimate. In any case, what a wealth of silent communication does seem to occur! Those seemingly scribbled figures represent archetypes of speaker and listener the world over.

Beyond them comes a most thoroughly worked-out nude. One sees a man swimming, or flying it may be, stretched out belly-down and furiously kicking his way along the wall at about shoulder level. By stretching out one's arms, one could just about take him in, holding one of his feet in place with a finger-touch, and at the same time stroking the hair of his head which is turned away to look through unimaginable transparencies of air and water—inside the wall, it would appear. And the drawing slows way down, as if a wealth of tender detailing were needed to keep the prone figure levitated for ever and ever. The whole slant of the belly is crosshatched with charcoal strokes, like reflected lights, or silvery ripplings of energy.

I pass directly now to the end wall, which is dominated by a standing woman (pp.86-87), a complement to the male figure at the opposite end. The woman holds something in one hand, perhaps a bow, leading Dr. Dal Poggetto to think of her as Diana. Her other hand loosely grasps the mantle suspended over her shoulder. She too is nude, and firmly formed but for her small pendulous breasts. Her profile seems intense but also obscure, smudged in beneath a lowering wilderness of hair. The wise woman stands solid on the earth; she appears awesome, larger than life, as it were an elemental mentality. The profile just beside her (obviously a detail much enlarged from the same vision in Michelangelo's mind) bears those words out. Never was any man's muse given more intense expression than here.

I have saved for the last the head of a bearded, strong-seeming and yet intensely suffering old man which dominates the left-hand wall of the room (opposite). Vaguely familiar, his face appears; is it not the Trojan priest Laocoön, whom serpents slew? (Michelangelo knew the classic sculpture of Laocoön and his sons at the Vatican.)

Michelangelo was an inveterate complainer: on that point his contemporaries agreed, and his friends found it understandable. Born to do great things for mankind, Michelangelo was frustrated more often than not by the worldly—which is to say deliberately shortsighted—policies of most of his patrons. Nothing could have been simpler than for him to please everyone, it was assumed, given his utter mastery; but Michelangelo had no real interest in pleasing anyone.

By preference he pushed his own great visions, like fists, right into people's eyes. Not even the Medici themselves, whose patronage made so much of his work possible, escaped the master's righteous ire. Indeed, when the Medici Pope Clement VII besieged Florence in concert with the Emperor Charles V, Michelangelo took the side of the city, and served as overseer of its fortifications. In the year 1530, Florence capitulated at last, and Michelangelo went into hiding: tradition says in the belfry of the Church of San Niccolò. But was that really the place where he concealed himself until the danger had passed? Dr. Dal Poggetto thinks not. After we left the lower room, the director remarked that it has been known for some years that Michelangelo was hidden by the prior of San Lorenzo (the church of which the Medici Chapel is a part), who wrote: ". . . I hid him from death and I hid his belongings." In his published report on the drawings, Dr. Dal Poggetto says: "It is therefore more than likely that the artist was hidden in a room connected to San Lorenzo, if not in this very room, from August 1530 . . . until the next November . . . and that he therefore had every possibility and plenty of time to sketch and draw. Hidden down there, with the door closed, the windows barred and the candle lit, he was able (with his ear tuned to the noises outside, fearing that every day might be his last) to rethink earlier ideas and 'jot down' memories, even very old ones, like the head of Laocoön which had so impressed him when it was discovered more than 20 years before. Even if this hypothesis smacks of fiction, it is not, however, improbable."

That is speculation, however. The important thing is that the drawings were preserved, in their secrecy, and have now come to light at last. They instantly form a part of all mankind's treasure, and witness to the highest hopes that we possess.

This is very likely the face of Laocoön, from the Hellenistic sculpture group discovered in 1506.

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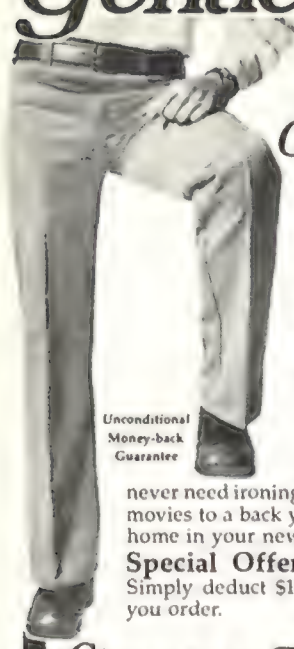

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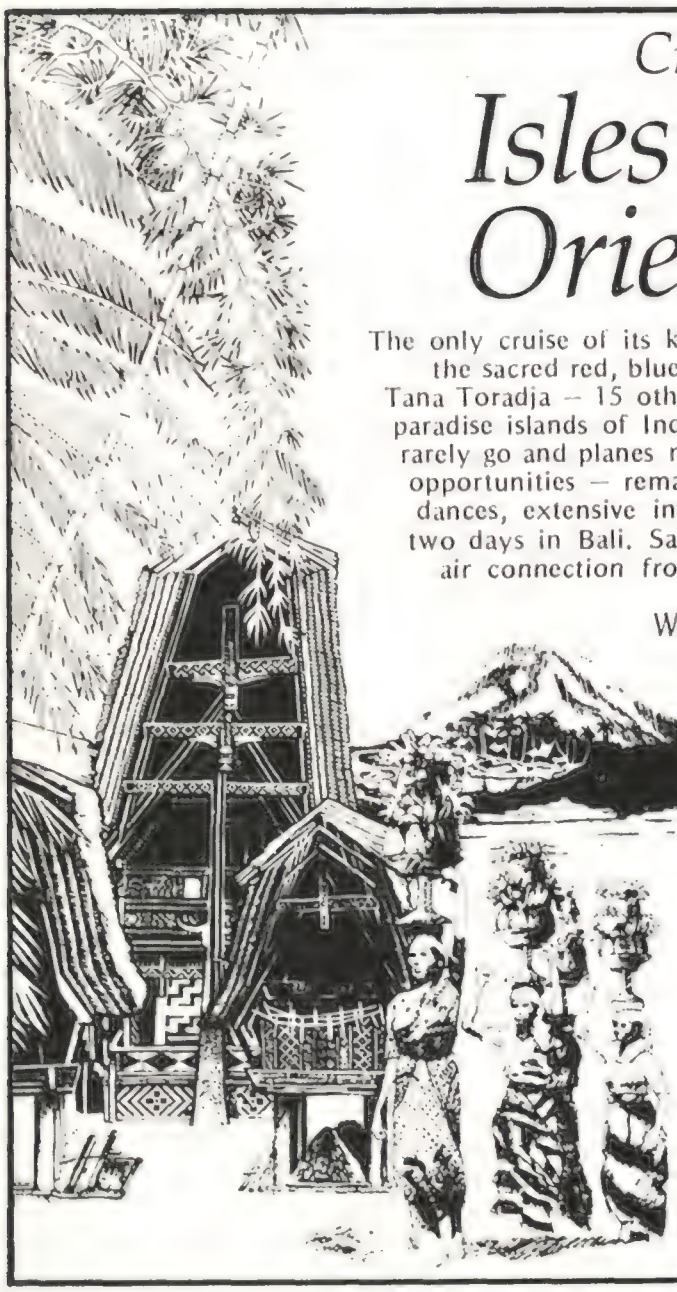

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By Arthur Evenchik

The right to dissent

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If the history of the United States has demonstrated nothing else in the course of 200 years, it has certainly shown that being an American is not easy. To be perfectly honest about it, the whole business can be a terrible burden at times. We, the American people, are the heirs to a philosophy that is so challenging and all-encompassing that living up to it is an extraordinary responsibility.

An American forfeits the right to claim superiority over others, for he (or, of course, she) is the product of a heritage of equality. He is forbidden by the spirit of the law (if not always by the law itself) to act on the basis of unjust prejudices. He has no right to scoff at the opinions of others without first considering them seriously, for he lives in a society which was meant to thrive upon freedom of expression. He must not be blind to the need for social change, for it is the recognition of that need which has inspired the greatest achievements of Americans throughout their history.

The true patriot can only be the individual who recognizes his burden and accepts it with a mixture of daring and awe; not the hopelessly average, flag-waving, "love it or leave it" symbol of machismo we have revered for too long. That latter image has caused irreparable harm to this country by distorting that aspect of liberty which is the most precious part of individual freedom—the right to dissent.

Unfortunately, dissent is not very popular these days. Its reputation has been soiled by those who regard any form of it as a crime akin to treason. Its image has been tarnished by those who have acted irresponsibly in its name. But the

The author, a 17-year-old from Lorain, Ohio, plans a career in journalism. A devotee of "Peanuts," he was astounded to find Charles Schulz as a contest judge.

right to dissent must never completely lose its significance. Our history has no meaning, the words of the Founding Fathers no relevance, if we cease to use it wisely and bravely in our own lives.

It is certainly true that not every act of dissent is constructive. We have been subjected to countless senseless diatribes and ravings in the last few years, and the specter of "ideological" violence still haunts our collective consciousness. However, even as we condemn and reject those dissidents whose means are useless or dangerous, we are not free to ignore their message. If indeed there is no justification for their grievances, we will find that out after examination, and we may well write them off as fools. In some cases, though, a different realization may develop. Even the most despicable of terrorists is a product of our society, and it behooves us to learn how to defuse the horrible anger he represents, before it erupts again in new acts of rage. There are injustices in this country which have been ignored for too long; and even while we deplore mindless rhetoric and violence, our obligation to correct these wrongs will never diminish.

It is regrettable that meaningless protest garners so much publicity, for it is far more important that we understand legitimate forms of dissent. No matter how many people console themselves with illusions of a "melting pot," there is no such thing as universal identity or agreement. This is what makes democracy such a sloppy operation at times, but our system is still well worth the trouble.

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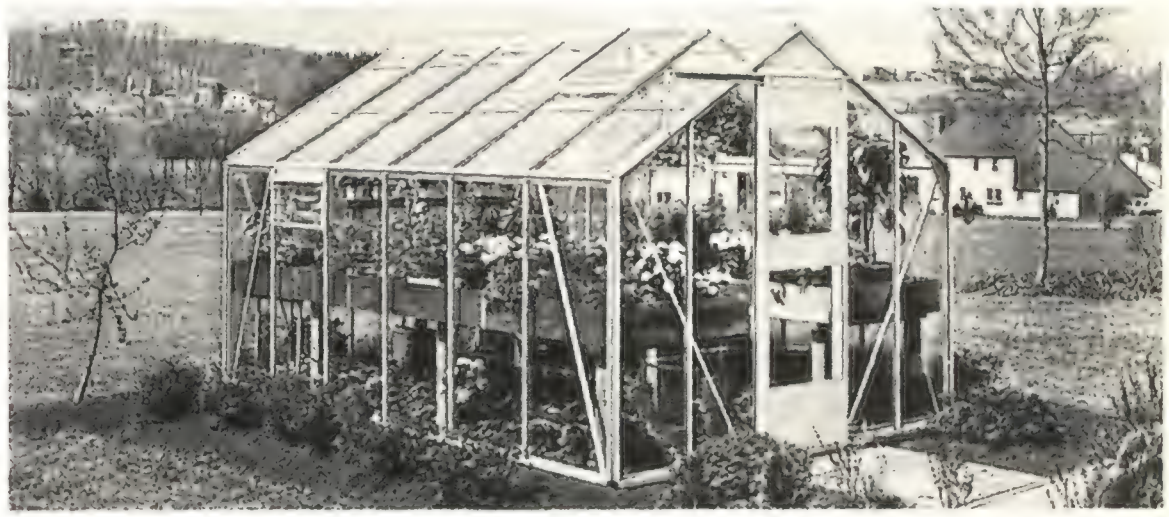

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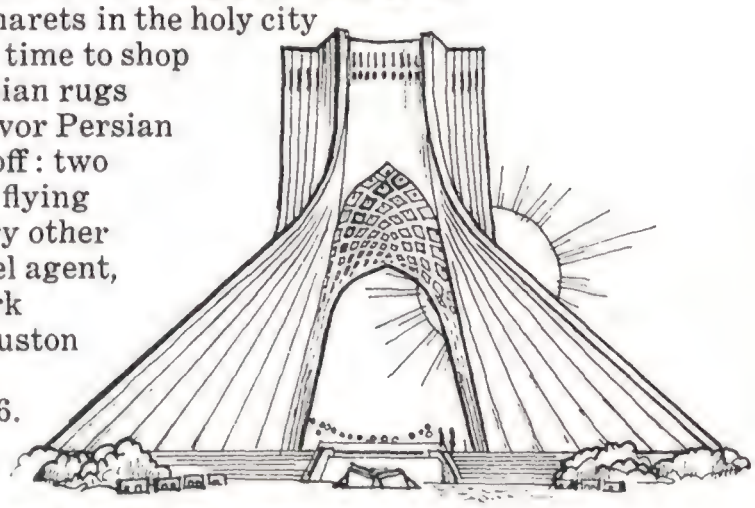

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vidual freedom, guaranteed by the Bill of Rights and every responsible law and verdict since. The right to disagree grants every citizen a unique identity based upon individual judgment. It is implicit in the freedoms of speech and press, and safeguards them from manipulation.

This does not mean that dissent can be meaningful only to the individual. Indeed, its implications extend far beyond that primary role. Dissent is the key to social change and human betterment. This can be seen most clearly in the area of institutional reform.

Most societies have a tendency to become dependent upon their institutions. The vision of the people contracts and falters until they are unable to conceive of any kind of social organization besides that which is familiar. Man-made conventions assume an aura of permanence.

This is a dangerous attitude, one that can lead only to stagnation and ultimate failure. We are saved from that fate by those with the courage to dissent. They are the ones who observe the faults and shortcomings of our institutions, and work for reform. They encourage new efforts to make our institutions more effective in every realm of society.

The dissenter must be conscious of the present while preparing for the future. Institutions must be continuously adapted, and alternatives must be constructed, in order to fulfill the requirements of a changing world.

This does not mean that there is no value in supporting social institutions.

The only family member who didn't offer advice on how to use the $10,000 essay

Many equally well-intentioned citizens may seek to preserve that which the dissenters oppose. This can only benefit a free society. We shall still depend upon the dissenters to raise the questions of debate, no matter how they may eventually be settled.

It would be ideal if dissent would fail only after reasonable discussion and exploration. That is not always the case. Dissent can fail when old prejudices are not overcome. It can fail when insecure citizens are afraid to view their established institutions critically.

The destiny of American society will depend largely upon its flexibility, upon the ability of its people to understand and utilize dissent. The very nature of dissent and democracy makes social change advance slowly, but they are still the only reasonable means we have to effect reform. They shall enable us to create exciting innovations in society.

In the broad spectrum of things, a span of 200 years in a nation's life is not very significant. In the very short lives of human beings, it is awesome. As we enter our third century, we can do no better than to remember and hallow the principles upon which our society is firmly grounded. Constructive dissent will be our most valuable tool in building a nation that fulfills the ideals of its creators. We can be the beneficiaries of a splendid paradox: by safeguarding the most significant dimension of individual freedom, we shall possess the resources to forge a society dedicated to the welfare of all.

competition prize was his 11-year-old dog, Frisky, who was the author's "inspiration."

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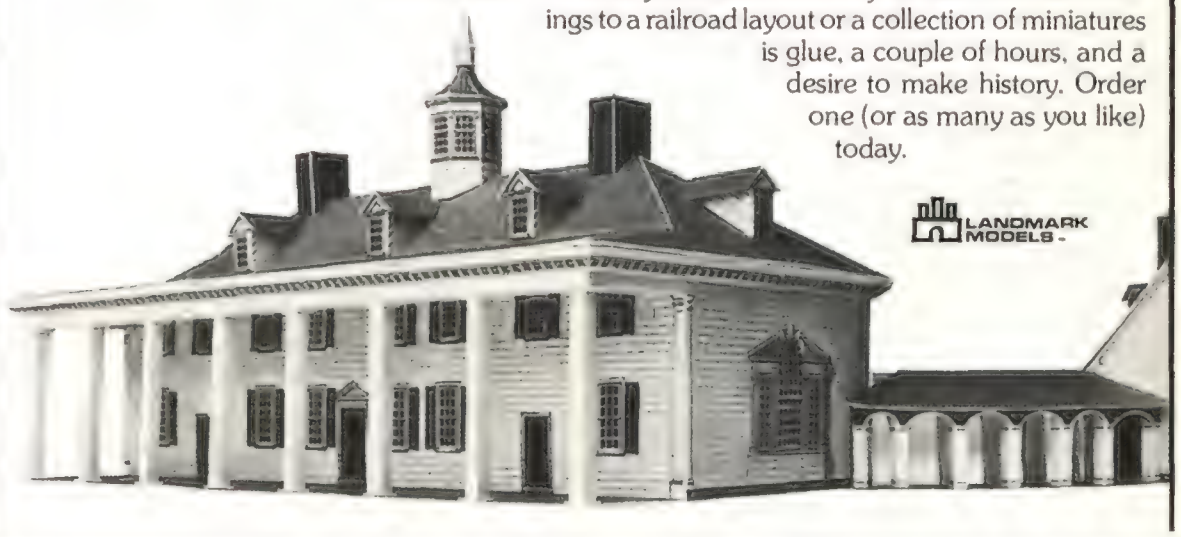

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Book reviews

How Cities Are Saved
Herbert R. Lottman
(University Books, $12.50)

Historically, the city was on a human scale; it provided its citizens stability and identity; it protected them. But the modern city does not nurture; its citizens are estranged from one another and from the countryside. In this travelogue of exemplary urbanism, Herbert R. Lottman tells how this process is being reversed in Western Europe, in the hope that these strategies can be applied closer to home. He has chosen a number of older cities (plus Tokyo and Jerusalem), because the threats there are more apparent—threats to graceful streets and public places, the reassuring "mix of people and things built up over generations."

On the broadest level, Lottman stresses the need for national growth policies and regional planning, under way in Europe but not yet significantly in the United States. The Netherlands, for example, encourages revitalization of its city centers and controlled growth. (In Amsterdam, all land acquired remains in public hands.) However, in old Jerusalem, its landscape changed by aggressive skyscrapers, the will to conserve is paralyzed by "insufficient urban planning instruments."

The better schemes favor the residents. In Grenoble, 13 percent of the budget goes for culture. In Bologna, a revolutionary housing policy contains real estate speculation and channels urban renewal into social concerns. It is one of the few cities where citizens have a hand in planning and where "slum removal is not poor people removal." By contrast, Venice, "the most spectacular renovation of them all," is becoming a "tastefully restored museum." Its antithesis is the vast Marais district, the heart of 17th-century Paris. The landmark status of this lively area testifies to the perseverance of a small band of volunteers in the 1960s.

Of course, France's "arsenal of protective legal measures," like those of Britain, provides better ammunition than the "loose system" of American or Swiss preservation laws. Yet, they, too, can succumb to the ubiquitous clashes of interest. One dramatic loss: the ancient ruins that gave way to an underground garage near Notre Dame cathedral. A dramatic victory: a 2,300-year-old Greek harbor, unearthed during renewal of downtown Marseilles.

More critical problems are also examined, such as how to reclaim the city from the car and clean up the air. Among the most spirited of the approaches cited is the Association for the Rights of the Pedestrian, a gritty Paris-based group. More potent (but no less admirable) are pedestrian zones, created in central streets and squares.

And what of our dual needs for the stimulation of cities and communion with nature? The author, regrettably, seems to despair of the two being reconciled within the city itself. But in his account of too much of the former, he describes a frenetic Tokyo, where the Japanese are "victims of their own success in concentrating population."

The only discussion that is less than incisive is the one on "urban peace." Having established that racial, cultural and economic differences, per se, do not give rise to crime, the author never really talks about what does. And surely the remedy must lie deeper than the police tactics and vandal-proof environment on which he dwells.

Yet, this shortcoming aside, the book is a useful one. It offers proof to the most hardened cynic that things can be changed, and it shows how. As Lottman says of public housing, the lack of money is no excuse, because there are too many good examples around. It is a matter of will and choice, and if humane solutions are not attempted, then it is a failure of talent and imagination.

—*Sandra Kashdan*
Assistant Director of Continuing Education, AIA

Great Plains Command: William B. Hazen in the Frontier West
Marvin E. Kroeker
(University of Oklahoma Press, $9.95)

Our 200-year history is so replete with colorful characters that many have been forgotten, among them even those whose names were once known to all. William Babcock Hazen (1830-87), Indian fighter, Civil War general, Indian affairs administrator and controversialist, was one of these; Marvin E. Kroeker now gives us a lively, scholarly account of him, focusing on his experiences in the West.

William B. Hazen

Hazen's first posts after graduating from West Point in 1855 were in the Pacific Northwest. In 1857 he was ordered to Texas, where in two years of service he took part in five successful expeditions against hostile Indians, being severely wounded in his last engagement. During the Civil War, having risen rapidly to the command of a brigade, he fought for the North at Shiloh, Chickamauga, Atlanta and elsewhere. It was during the Civil War that he made the first of his influential enemies, including such notables as General Philip H. Sheridan.

After the war Hazen remained in the army and held a number of appointments in the West. In 1868-69, while in charge of the Southern Indian Military District, he played a major role in placing the Southern Plains Indians—including Kiowas, Comanches and Wichitas—on reservations. Although he believed in punishing hostile Indians severely, he also believed in fair treatment for the others and he argued for reforms in the Indian Bureau. In 1870, when he headed a commission to determine what compensation should be paid those Creek Indians who had remained loyal to the government during the war—and in consequence had lost land and other possessions—he made a complete and careful study of the claim and recommended payment of $1.8 million. But only $100,000 was paid. In 1904 an additional $600,000 was awarded.

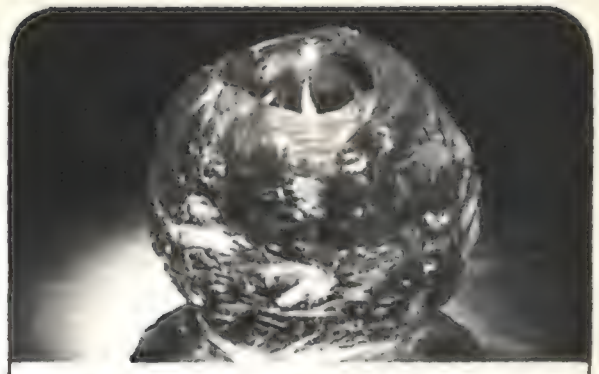
In 1870 Hazen was sent to Europe to observe the Franco-Prussian War. Two months after his return, at age 41, he married Mildred McLean, the 21-year-old daughter of Washington McLean, owner of the *Cincinnati Enquirer*.

In the year following his marriage he published *The School and the Army in Germany and France* in which he expressed admiration for the German military system and made a number of comparisons between the American and German armies that provoked the wrath of his colleagues. He criticized the American staff departments, condemned political favoritism, and damned the "indolence, ignorance, and shiftlessness" of American officers.

Hazen next initiated what came to be called the Arid Lands Controversy. The Northern Pacific Railroad, in its attempts to obtain settlers on its lands, advertised the Great American Desert as a "Fruitful Garden" and maintained that thanks to an "aerial Gulf Stream" the winters were quite mild on the northern plains. Hazen, in a long letter to the *New York Tribune*, refuted this claim and declared that most of the land was arid and not worth "one penny an acre."

Most of the controversies that swirled around Hazen were self-generated. It was his exposure of the corrupt practices of traders on army posts that led to Secretary of War William W. Belknap's impeachment by Congress. This generated another dispute when Colonel David S. Stanley, encouraged by Belknap, accused Hazen of perjury in his testimony during the impeachment trial and of cowardice during the Civil War. Hazen demanded that Stanley be court-martialed, but instead it was decided to try both officers by the same court. In the end, Stanley was lightly admonished; Hazen's case was never heard, but his reputation was damaged.

Although he decried political favorit-



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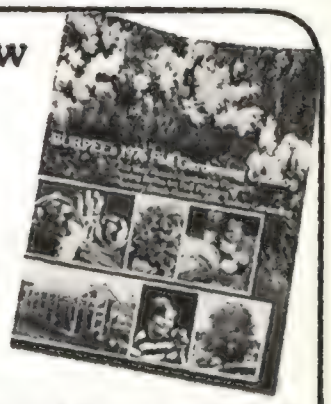

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ism in the army, Hazen was a close friend of James A. Garfield, and in 1880 when Garfield was elected president, Hazen requested and received an appointment as a brigadier general and Chief Signal Officer. He continued, however, to create controversy, and several years later was found guilty by a court-martial of unduly criticizing his superior, Secretary of War Robert Todd Lincoln.

Hazen died of kidney poisoning at the age of 57. Twelve years later his widow married Admiral George Dewey, the hero of Manila Bay.

—Byron Farwell
Author, *The Great Anglo-Boer War* and *Queen Victoria's Little Wars*

The Eskimo and His Art
Carson I. A. Ritchie
(St. Martin's Press, $15.95)

Eskimo culture, an ancient and long-enduring phenomenon, once commanded a large segment of the globe. The part, it might seem, that nobody could possibly want, a vast borderland between frozen land and frozen sea stretching from the northern tip of Asia across the top of the North American continent to the very edges of Europe. Like all of the technologically backward cultures on spaceship Earth to survive into the modern age, that of the Eskimo suffered grievously, irreparably and inevitably from contact with the expansionist, inventively advanced culture of Europe.

The merit of this thin (80 pages) book is the uncondescending and unsentimental text by scholar-traveler Carson I. A. Ritchie, which vividly sketches the important, cohesive qualities of Eskimo life and culture from the reaches of time beyond memory to the tip of the present day. Without foolishly concluding or urging that the clock can be rolled back, he ends with the present, and on a hopeful note. The emergence of an Eskimo art popular in Western markets in recent years is partly a sign of, and partly a stimulus to, a broader appreciation of Eskimo history and culture. It demonstrates that "however drastic the changes have been . . . they have not obliterated in the Eskimo that natural man who is an untaught, spontaneous artist."

Ritchie does not stress the point—it is a mark of his storytelling tact that I cannot be sure he even mentions it—but the longevity of Eskimo culture is one of

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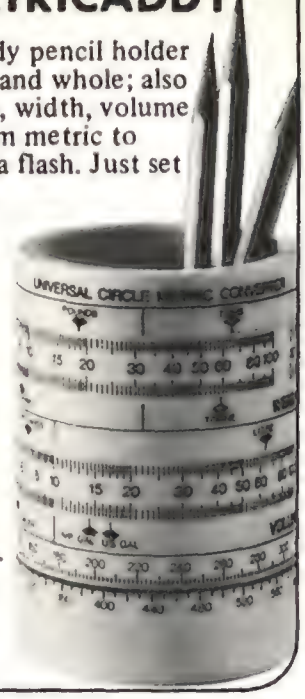

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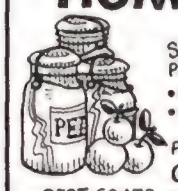

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humankind's greater lessons in adaptive behavior. As we speed ever faster into the future, it is the sort of lesson we ignore at our peril. Eskimo technology, epitomized in the inventions of the igloo dwelling, the kayak traveling mechanism, and the indispensable parka body-covering, may seem quaint in the NASA age but it signals a society with a healthy respect for its natural environment.

A carved whale's tooth, from the book

Scarcely less impressive than Eskimo ingenuity, however (and the list above of course is greatly foreshortened), is the astonishing good humor of a society that fed itself and survived for more than four millennia in a world that to us can only seem nearly as forbidding a life-supporting system as our recently visited moon. Eskimo art, even the predominantly religious art of the past, is in a way but another facet of the astounding Eskimo combination of adaptive inventiveness and good humor.

The book is poorly designed, and most of the illustrations are but haphazardly connected to the text. The omission of a bibliography is also unfortunate. Nonetheless, the redeeming text, full of fascinating detail suggesting the true complexity of the subject, is a compelling popular introduction.

—Benjamin Forgey
Art critic, *The Washington Star*

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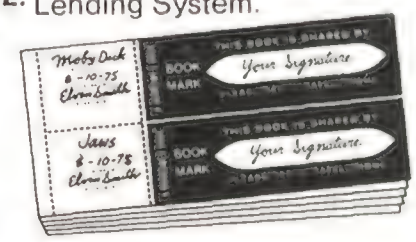

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Venice Restored*—September 16-30: Dr. David Alan Brown and Anne Radice, both of the National Gallery of Art, explore art and life of Venice • **Morocco and Egypt**—September 26-October 19: Temples, palaces, souks and archaeological sites • **Adriatic Shores**—October 2-17: Art, architecture and archaeology. Cruising aboard the yacht *Argonaut*, visit cathedrals, palaces and museums on both coasts to the Adriatic. Sail from Athens through the Greek islands, calling at eastern Italian cities up to Renaissance Venice, then sail down the Dalmatian Coast of Yugoslavia with calls at Split, Dubrovnik and Kotor, returning to Athens • **Greater Antilles Cruise**—January 3-10, 1977: Cruise on *MTS Argonaut* in Antilles; architecture and historic preservation in Puerto Rico, Haiti and Jamaica • **Far East**—January 28-February 22, 1977: Singapore, plus a nine-day Indonesian cruise, Thailand and Hong Kong • **Jordan-Holy Land**—March 8-13, 1977: Archaeology in Jordan for one week; two weeks of historic sites in and near Jerusalem (accommodations and study at St. George's College) • **Russia**—June 1-22: Emphasizing art history in Georgia and Armenia • **Norwegian Fjord Cruise**—July 31-August 18, 1977: Cruise through Norwegian fjords and Baltic on *MTS Argonaut*, including a trip to Leningrad • **Scotland and Great Britain Cruise**—August 20-September 3, 1977: Scotland and Great Britain aboard the *Argonaut* • Write Miss Bliss Schumann, Foreign Study Tours, SI 123, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5520. *Optional predeparture lectures will be offered.

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Massachusetts Heritage—August 15-23: Visit Salem, Deerfield, Old Sturbridge Village to learn about early American antiques, decorative arts, and architecture. Also the Boston Symphony at Tanglewood • **Desolation and Gray Canyons**—September 3-13 and October 8-18: A white-water trip for the adventurous; explore the geology, wildlife, Indian and outlaw history of Utah's Green River • **Pacific Northwest**—September 7-18: Enjoy the scenic beauty of Mt. Baker, Mt. Rainier and the Hoh Rain Forest on this nature tour of Washington • **Hirshhorn Sculpture Weekend**—September 17-19: A weekend devoted entirely to the Hirshhorn's extensive collection of modern sculpture from Auguste Rodin to the minimal and kinetic pieces of today • **Coastal Maine and New Hampshire**—September 25-October 3: A nature tour of Acadia National Park and White Mountains during the peak of foliage color • **California Wine Country**—October 3-9: Learn about California wines with lectures and wine tasting at selected vineyards • **Archaeological Field School**—October 9-16: Join archaeologists in the excavation of an Illinois village ruin dating to the Mississippian Period (A.D. 900-1400) • **Colonial Williamsburg**—October 24-28: A program planned for adults to learn about life in 18th-century Virginia through tours and special lectures • **Philadelphia Art & Architecture**—November 3-7: Emphasis on the Pennsylvania Academy of Arts and Bicentennial art exhibit; reopening of Philadelphia Museum of Art • **Gem Mines Field Trip**—November 4-9: Join gem experts in the field study of western North Carolina gem mines • **NASM Weekend**—November 12-14: Special program with staff to see and learn about new Air & Space Museum • **Tropical Greenery of Puerto Rico**—November 28-December 8: Discover the island's contrasting terrain with guided tours through forest reserves, national parks, coffee plantations and mangrove communities • **Washington "Anytime" Weekend**—Visit the nation's capital and tour the original Smithsonian building. Spend two nights at Loew's L'Enfant Plaza Hotel (reservations required ten days prior to weekend) • Write Associates Travel Program, A & I 1270B, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5635 for information.

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Smithsonian highlights

The June issue of SMITHSONIAN contained a special, detachable section highlighting major Bicentennial exhibitions and summertime activities at the museums. Information about parking, shopping, food and education facilities was included, as well as maps of the Mall and the Festival of American Folklife. If you're coming to Washington in August, see the "Summertime at the Smithsonian" section in our June issue. For up-to-date busing and parking information call, toll free, (800) 424-9755 or, if in Washington, 637-2437. Also note the addition of a new, free shuttlebus service between the National Zoo and the Carter Barron parking lot (16th and Morrow N.W.). The service is available weekends only from 10 A.M. to 6 P.M. Buses depart every 15 minutes.

For Associates not coming to Washington, the Smithsonian Institution Traveling Exhibition Service is circulating hundreds of shows throughout the country. A number of the exhibitions on view in larger cities during the next two months are listed below. For further information, write SITES, Smithsonian Institution, Washington, D.C. 20560.

- Albuquerque, New Mexico—"Population: The Problem Is Us" explores implications of the world's increasing population and offers suggestions for the future, including new habitat possibilities, energy sources and food resources. The exhibit is made up of color photographs and text (Museum of Albuquerque, September 4-October 3).
- Austin, Texas—"Indian Images" is an exhibition of photographs from the National Anthropological Archives. It depicts the life-styles, traditions and cultures of North American Indians (University of Texas, August 1-29).
- Charleston, South Carolina—"Treasures of London" is a show of British silver, including antiques from the Goldsmith's Hall and modern jewelry by British silversmiths (Charleston Museum, August 7-September 12).
- Chicago, Illinois—"The Fourth Part of the World" depicts the exploration and development of Australia, with emphasis on its relationship to American history (Museum of Science and Industry, August 20-October 2).
- Defiance, Ohio—"Manuscripts of the American Revolution" provides a panorama of the Revolutionary era beginning with the Stamp Act of 1765 and ending with the election of George Washington. The show includes letters and documents of Washington, Samuel Adams, John Hancock and Benedict Arnold (Defiance Area Bicentennial Commission, August 1-29).
- Fresno, California—"Underwater Photography of Edwin Janss jr" explores seldom-seen phenomena of sea life through vivid color prints of sea anemones, bril-

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liantly hued coral and starfish (Fresno City College, August 28-September 26).

• Fort Missoula, Montana—"American Coverlets" outlines the 19th-century techniques of creating coverlets woven of wool, linen and cotton (Fort Missoula Historical Museum, August 1-29).

• Greenville, Michigan—"Danish Expressions in Textile" includes rag and tapestry designs of 20 top Danish weavers (Greenville Area Community Center, August 1-29).

• Huntington, West Virginia—"Edvard Munch: The Major Graphics" is an exhibition of etchings, lithographs and woodcuts, complemented by photographs of the artist in his studio (Huntington Galleries, September 4-October 3).

• Kansas City, Missouri—"Delacroix and the French Romantic Print" features the works of Delacroix, along with lithographs, etchings and engravings by other French Romantic artists (Nelson Gallery, August 1-29).

• Lincoln, Nebraska—"New Glory, Part I" is a show of reproductions of 28 flags and pennants designed during Colonial and Revolutionary times (University of Nebraska, August 7-September 5).

• Logan, Kansas—"American Art in the Making" surveys the major currents of 19th-century American paintings through preparatory drawings, watercolors and oil sketches (Dane G. Hansen Museum. September 18-October 17).

• Madison, Wisconsin—"American Prints from Wood" examines the development of the woodcut and wood engraving in American art from the late 18th century to the present (Elveham Art Center, August 14-September 12).

• Mansfield, Ohio—"American Agriculture: A Continuing Revolution" looks at three revolutionary aspects of agriculture: horsepowered machinery; mechanical engines and implements, and scientific techniques (Richland County Agricultural Society, August 10-September 19).

• Memphis, Tennessee—"Twenty Bicentennial Banners" by widely known contemporary artists are designed in brilliantly colored and strikingly unique images appliqued and embroidered on nylon fabric (National Bank of Commerce, August 1-29).

• New Haven, Connecticut—"American Presidential China" is a major exhibition of personal and state china used by Presidents from Washington through Ford (Yale University Art Gallery, July 24-September 5).

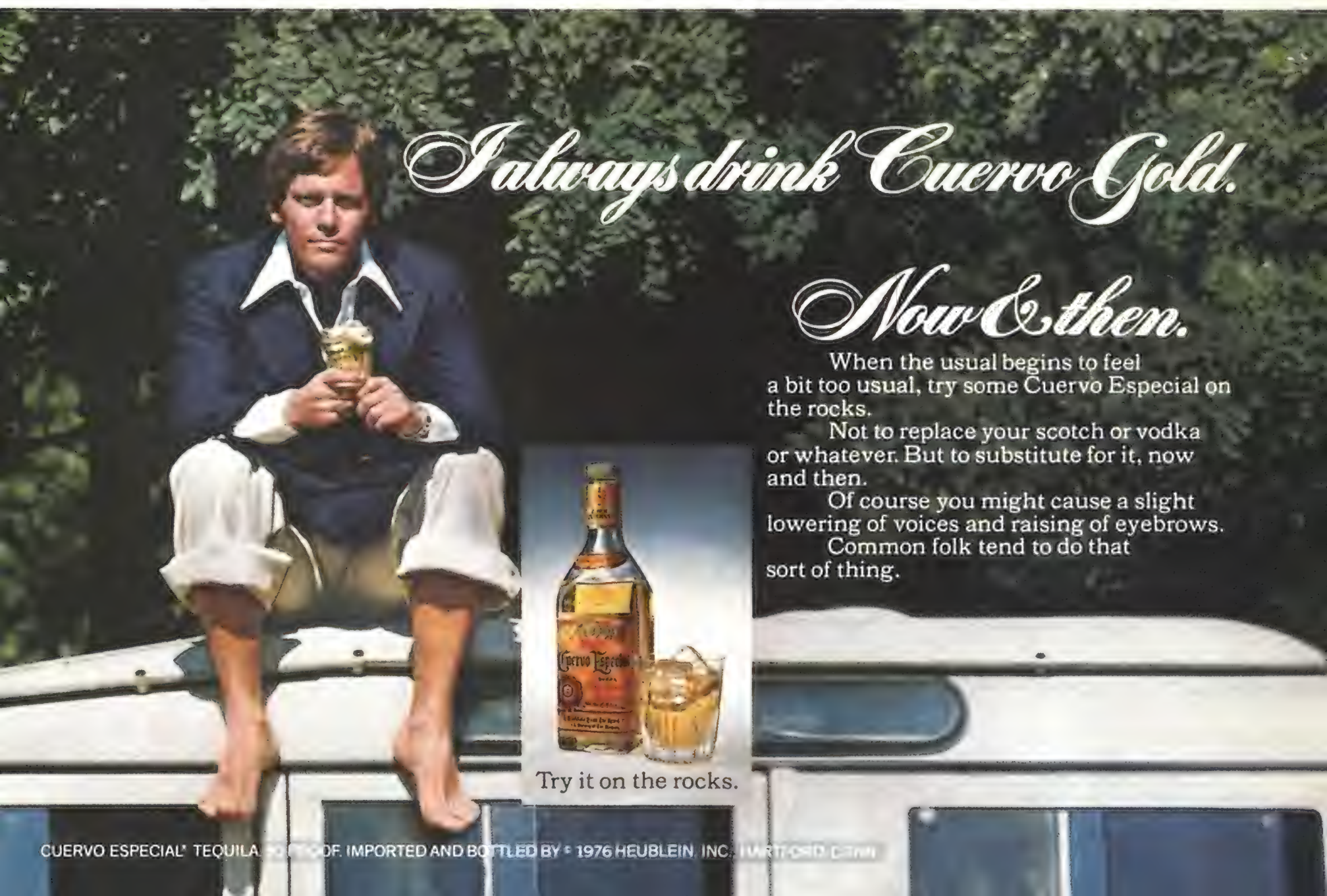
• New Orleans, Louisiana—"Blacks in the Westward Movement" traces the contributions of blacks in the frontier movement (Louisiana State Museum, August 7-September 5).

• Oaklawn, Illinois—"Victorian Needlework, accessories and patterns" (Oaklawn Bicentennial Committee, August 1-29).

• Okemos, Michigan—"The Inaugural Story: From George Washington to Gerald Ford" depicts through prints, photographs, memorabilia and text the pageantry surrounding inaugurations (Meridian Mall, July 24-August 22).

• San Francisco, California—"Zoo/100: The Zoo as a Cultural Institution" examines the architectural and cultural context in which animals are exhibited to the public, including display methods in gardens, animal palaces, theaters and game parks. (San Francisco Zoological Society, August 28-September 8).

• Springfield, Massachusetts — "Ride On!" is a photo-panel exhibition tracing the social and technological history of the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bicycle and its role in current transportation planning (Science Museum, July 24-October 10).

• St. Paul, Minnesota — "WPA/FAP Graphics" includes lithographs, engravings, etchings, woodcuts and serigraphs commissioned by the Works Progress Administration Federal Art Project during the Depression (Minnesota Historical Society, August 7-September 5).

• Suffern, New York—"Our Only World" presents in color photographs and text panels the nature and scope of America's environmental crisis and discusses alternatives to present land- and resource-use policies (IBM Corporation, September 4-October 3).

• Syracuse, New York—"200 Years of Royal Copenhagen Porcelain" includes dinnerware, figurines and unique art objects from 1775 through the 19th century (Everson Museum of Art, August 1-September 5).

• Tampa, Florida — "Silverworks from Río de la Plata, Argentina" shows 200 years of silver from liturgical objects to gaucho apparel (Huntington Galleries, September 4-October 3).

• West Palm Beach, Florida—"Antwerp Drawings and Prints from the 16th and 17th Centuries" exhibits works by 50 of Antwerp's master draftsmen and engravers (Norton Gallery of Art, July 24-September 12).

Contributing Memberships

Contributing Members of the Smithsonian Associates support the Institution's work in education, research and scholarship. There are three categories of membership: supporting at $50, donor at $100, and sustaining at $500. Among the special privileges offered to contributing members are:

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Additional reading

Ajanta caves (p. 32)

"The Splendours of Indra's Crown: A Study of Mahayana Developments at Ajanta" by Walter Spink, *The Royal Society for the encouragement of Arts, Manufactures and Commerce Journal,* October 1974

Ajanta, Painting of the Sacred and the Secular by Madanjeet Singh, The Macmillan Company, 1965

Morgan horses (p. 44)

Morgan Horses by Peggy Jett Pittenger, A. S. Barnes and Company, 1967

The Morgan Horse by Jeanne Mellin, The Stephen Greene Press, 1961

Greenwich (p. 64)

1776, The British Story of the American Revolution, sponsored by *The Times, The Sunday Times* and Barclays Bank, National Maritime Museum (Greenwich, London), 1976 (catalog accompanying the exhibit)

Lincoln Hill (p. 74)

Landscapes by John Brinckerhoff Jackson, University of Massachusetts Press, 1970

The First Americans by Thomas Jefferson Wertenbaker, The Macmillan Company, 1927

Economic and Social History of New England 1620-1789 by William B. Weeden, Houghton Mifflin Company, 1890, reprinted by Hillary House Publishers Ltd., 1963

Customs and Fashions in Old New England by Alice Morse Earle, Charles Scribner's Sons, 1893, reprinted by Corner House Publishers, 1969

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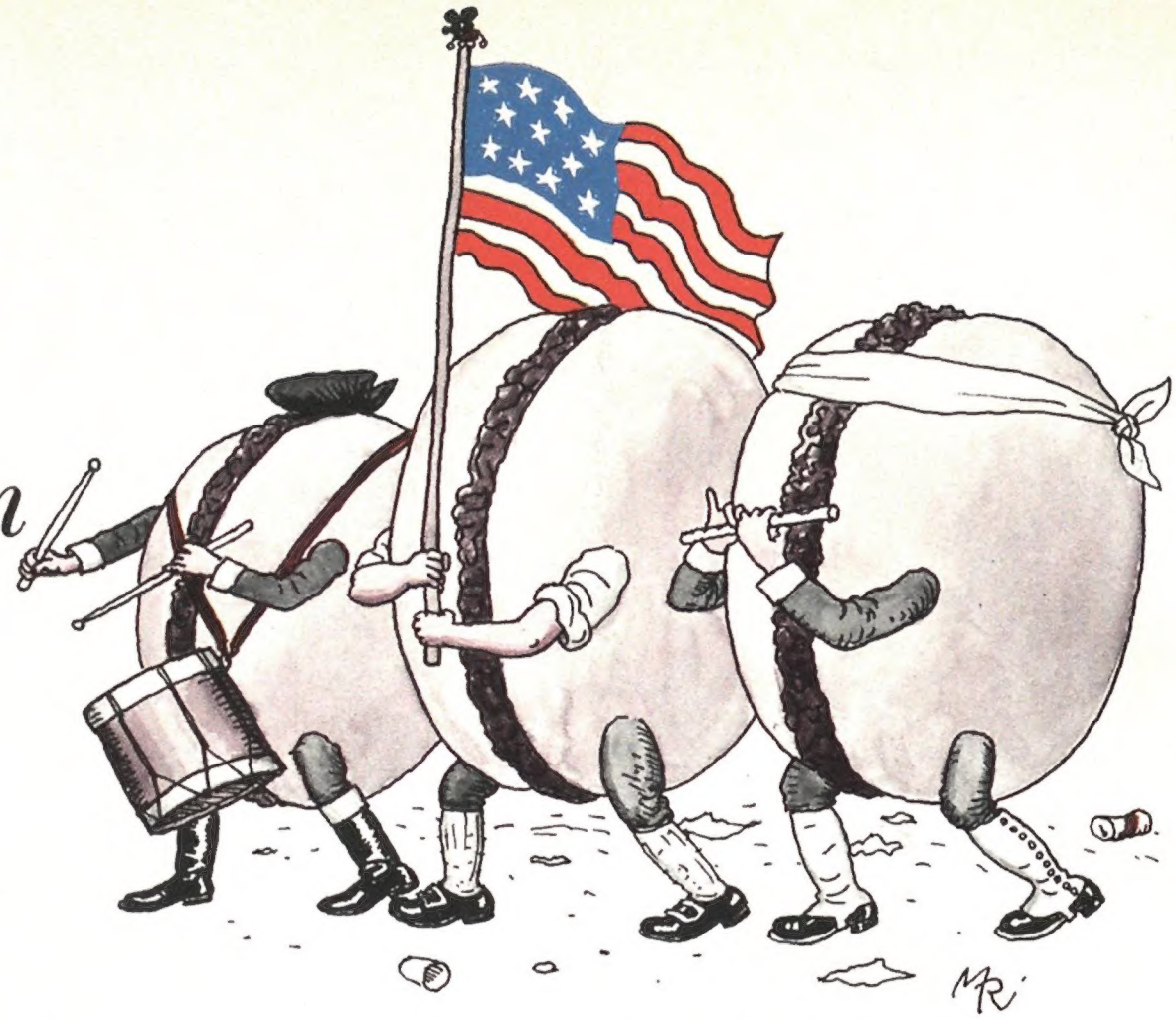
What is more native than mom and apple pie?



Jeremiah Johnston was a good family man, good provider and good father. Just as well, for he and his cherubic wife Eldorabell produced an ever-increasing number of bright-eyed, outspoken, hungry offspring who filled their house with laughter and merriment.

Jeremiah dreamed of a time when he could assemble the group and take them on a trip across the country to show them how other people lived, maybe going as far from home in Indiana as Washington, D.C.

One day he confided his dream to Eldorabell; alas, the children overheard.

Such license was blatant permission to hold a family council. The key question was What shall we eat? The unanimous and vociferous answer: "Hamburgers!"

By dawn they were out of bed and off, as the family jalopy wheeled forward. On the first day of travel, at exactly 9:30, the first howl of hunger came from someone in the back seat. "Daddy, I want a hamburger, Daddy, I want a hamburger. I want a hamburger."

To this demand, the patriarch immediately laid down an unpopular rule: "No hamburgers before 11 in the morning." The edict turned out to be impossible to enforce. Hunger pangs are difficult to withstand. Moreover, the excursionists became more insistent and harder to control when flashing multicolored neon signs along the roadside entreated them to eat burgers of every kind and description.

Long before the 11 o'clock deadline, alert Suzy had seen the many varieties of burgers and decided that she wanted a Jollyburger. Henry, always hungry, thought he'd take a Doubleburger. Romantic Eldorabell (named for her mother) was firm in her demand for a Flame-kissedburger. George, the big muscleman, in training for weight lifting, demanded a Champburger. Then there was Alice, the duly elected president of her Sunday school class, who insisted she have a Divineburger. One of the other children wanted a Charburger, another a Chickenburger, still another a Courtburger.

Two days' travel produced ample evidence of different appetites. Poor old Jeremiah created quite a disturbance when he drove up to a filling station (that is, a human filling station) to satiate his riders' tummies.

The trip's busy record keeper pulled out his list of almost two-and-a-half dozen different kinds of burgers for his brothers and sisters to scrutinize:

Plentyburger	Deliciousburger
Beefburger	Selectburger
Cheeseburger	Courtburger
Miniburger	Supriseburger
Flame-kissedburger	Charburger
Mooseburger	Divineburger
Whataburger	Chickenburger
Pleasantburger	Goatburger
Sizzleburger	Champburger
Fishburger	Oxburger
Nutburger	Swordfishburger
Jollyburger	Doubleburger
Dudeburger	Chiliburger
Bullyburger	Delightfulburger

Upon arrival back home everyone was still hungry and when asked what they wanted for dinner, yelled in unison, "Hamburgers!" Mother Eldorabell got out her skillet and fried—you guessed it—real hamburgers.

Fine for them. But when Jeremiah picked up his evening newspaper and saw a headline that read, "HOMETOWN SENATOR CALLED HUMBURGER," all he could do was shake his befuddled head and submerge himself in the other events of the day.

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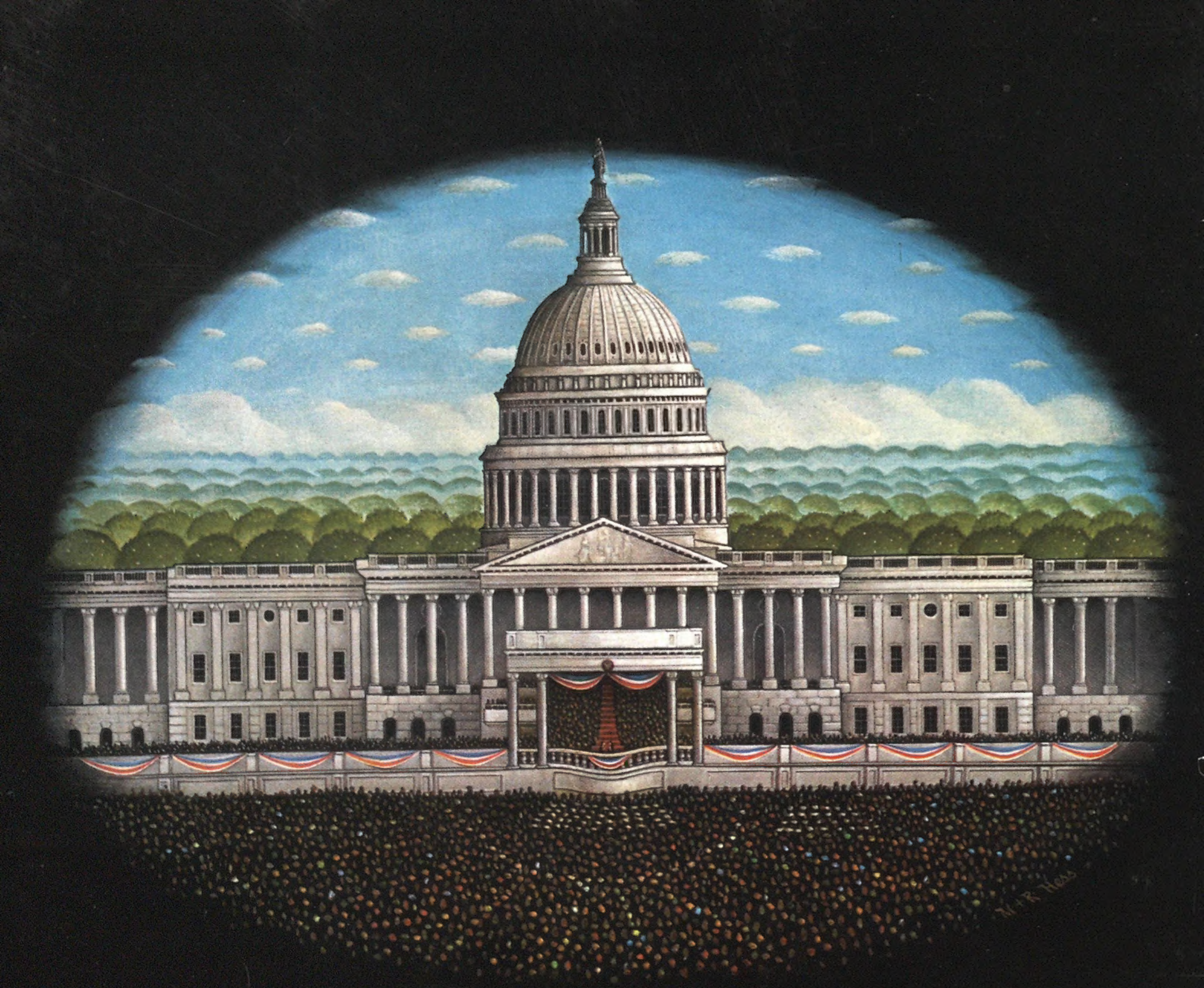

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